APRIL 13, 1959

STEEL
The Metalworking Weekly

A PENTON PUBLICATION

Keeping Wages in Line

You can best do it by: 1. Knowing your wage costs. 2. Eliminating hidden costs in your labor contract. 3. Re-evaluating your incentive program. 4. Improving company climate so that managers provide leadership, not merely pushership . . . . . Page 95

A PROGRAM FOR MANAGEMENT 1959 . . . No. 3

Page 51 . . .

Can Unions Find New Leadership To Solve Problems of 1960s?

Page 58 . . .

Depreciation: Initial Writeoff?

Page 106 . . .

Aluminum-Magnesium Alloys Move into Structural Field

Page 110 . . .

Alloy Ups Life of Furnace Parts

Page 128 . . .

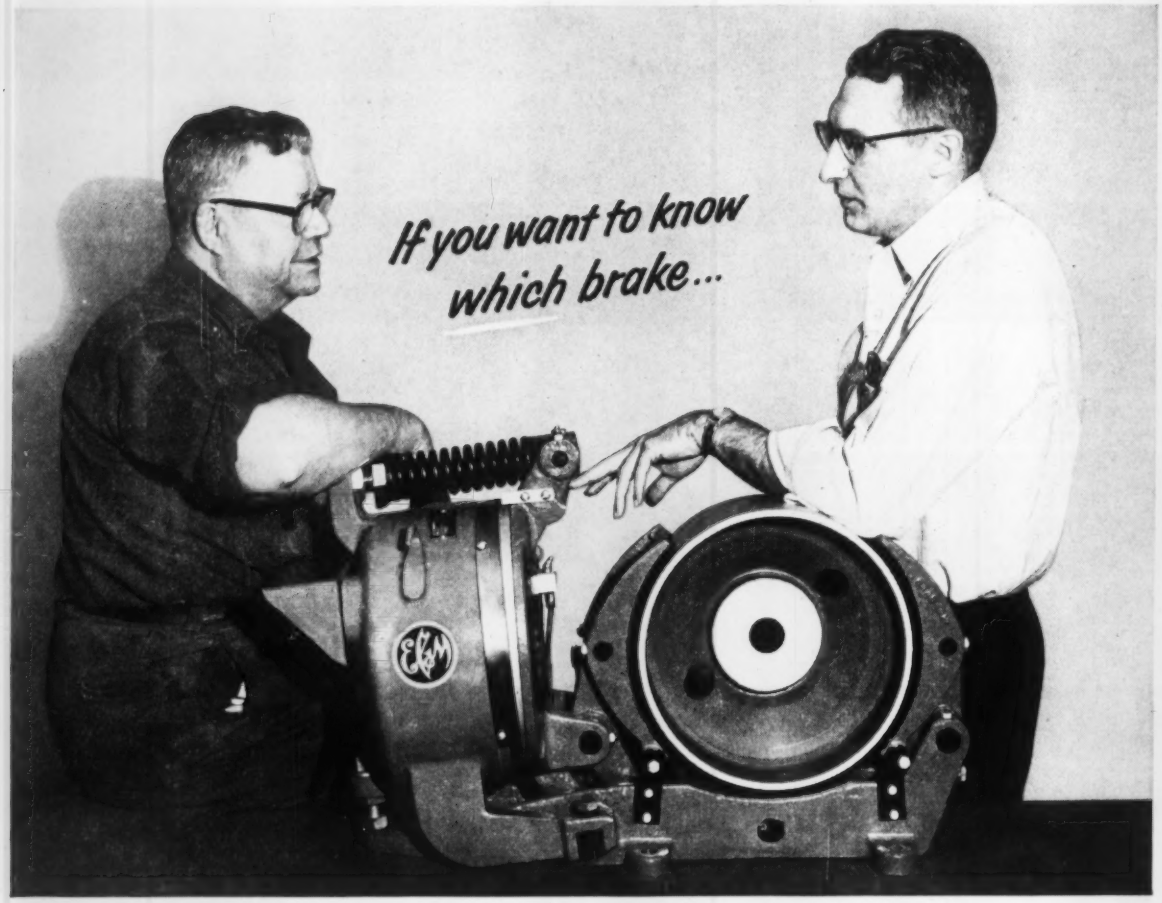
Standard Machines vs. Specials

Page 141 . . .

Re-Bars Gain, Especially Imports

METALWORKING OUTLOOK—Page 43

CONTENTS — PAGE 5



Ask the Maintenance Men!

There are certain standards of performance maintenance men expect of any brake used on crane or mill applications. EC&M's WB Brakes, they'll tell you, have surpassed those standards for years—with plenty to spare.

It's when you ask about installation and maintenance that you'll find why so many of these men prefer Type WB Brakes.

Without getting into a lot of detail, here are a few features of WB Brakes which the maintenance men rate very high—

Manual release for free rotation—a real convenience when you're setting up a new installation. Or want to lower a load on power failure. Or when you're replacing a shoe or lining. ***Single adjustment for lining wear***—so simple yet so positive. ***Connecting lever below brake wheel***—really speeds up armature replacement. ***Recessed armature*** lets dust and magnetic particles fall free—no periodic "digging out". ***No freeze or bind***—if lubrication is ever needed to free any part, WB Brakes have alemite fittings at all points.

***SIX SIZES** of WB Brakes cover the complete range of 600-series motors*
Write for the New Bulletin 5000—it tells all

THE ELECTRIC CONTROLLER & MFG. CO.
A DIVISION OF THE SQUARE D COMPANY
CLEVELAND 28 • OHIO

2637

XXX

This is the thirtieth of a series of advertisements dealing with basic facts about alloy steels. Though much of the information is elementary, we believe it will be of interest to many in this field, including men of broad experience who may find it useful to review fundamentals from time to time.

Evaluating the Machinability of Alloy and Carbon Steels

To produce a useful part, most steel has to be shaped by one or more of the metal forming methods. One of these is metal cutting or machining, which changes the shape, size, or finish of a workpiece.

Alloy or carbon steels are often received from the mill in the raw form of bars, forgings, or castings. The steel is placed in a suitable machine, such as a lathe, multiple-spindle automatic bar machine, drill press, milling machine, or one of a number of other types. Metal is then removed from the steel stock until it has acquired the desired shape. This is accomplished by causing motion to take place in the sharp-edged cutting tool, or the piece of steel, while they are held in contact with each other. Cutting tools, such as drills, tool bits, milling cutters, and the like, are made from highly-alloyed steel (tool steel), cast alloys, sintered carbide, or even ceramic material.

During machining, the metal is removed in the form of chips which may be of any length, from the short, well-broken type, to the long, stringy and continuous variety—depending upon the nature of the steel, the shape or geometry of the cutting tool, the speed and feed at which the cutting is done, and the coolant or cutting fluid applied.

"Machinability" of steel refers primarily to the ease with which it can be reduced to its final shape. It is measured by the speed and feed at which it can be cut, the quality of the surface finish produced, the length of time the tools will last, and the kind of chip formed in cutting. In a "free-machining" grade of steel, for example, high speeds and feeds can be used, tools will stand up well, surface finish will be good, and chips well broken.

Machinability is evaluated in the shop by the number of pieces having a satisfactory finish, within the required dimensional tolerances, that can be produced in a shift, or a day, with adequate tool life.

It can be appreciated that the study of the cutting of metals involves a large number of variables. These may be grouped in the following way:

1. Steel Analysis (Process, composition, microstructure, and mechanical properties)
2. Machine Tool (Condition, tool accessories, range of cutting speeds and feeds with ample power, etc.)
3. Type of Machining Process (Turning, milling, forming, broaching, etc.)
4. Cutting Condition (Speeds, feeds, and depth of cut)
5. Cutting Tool (Composition, treatment, hardness, size, shape, grinding and surface finish)
6. Cutting Fluid (Characteristics, application, and volume)

From this number of complex factors, laboratory tests and investigations have developed experimental data by using single variables, such as steel analysis, tool analysis, tool shapes, and cutting fluids. This information has proved to be a useful guide when combined with industrial experience; for no test method by itself has yet been developed that will include all the characteristics of a specific single or multiple-machining operation.

Bethlehem metallurgical engineers have had long and varied experience and knowledge on the machinability of alloy and carbon steels. They will gladly give you any help you may require in connection with machining problems.

In addition to manufacturing all AISI standard alloy steels, Bethlehem produces other than standard analysis steels, and the full range of carbon grades. Call your nearest Bethlehem sales office for information.

If you would like reprints of this series of advertisements, please write to us, addressing your request to Publications Department, Bethlehem Steel Company, Bethlehem, Pa. The subjects in this series are now available in a handy 44-page booklet, and we shall be glad to send you a free copy.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.
On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation
Export Distributor: Bethlehem Steel Export Corporation

BETHLEHEM STEEL

BETHLEHEM STEEL

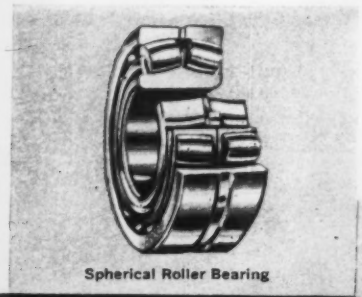
What qualities should a "production" bearing have?

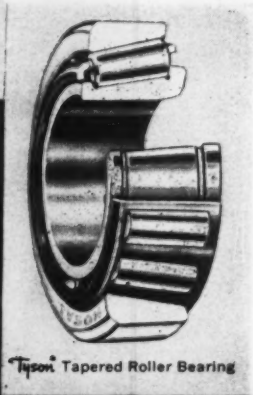
Take a single-row deep-groove bearing, for example.

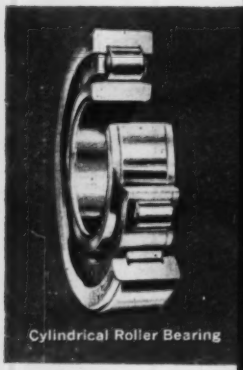
As SKF makes it, the type shown here sustains heavy radial load—as well as thrust load in either direction—it can be used at normal speeds with grease lubrication or at high speeds with oil. *Yet it is a standard SKF bearing.*

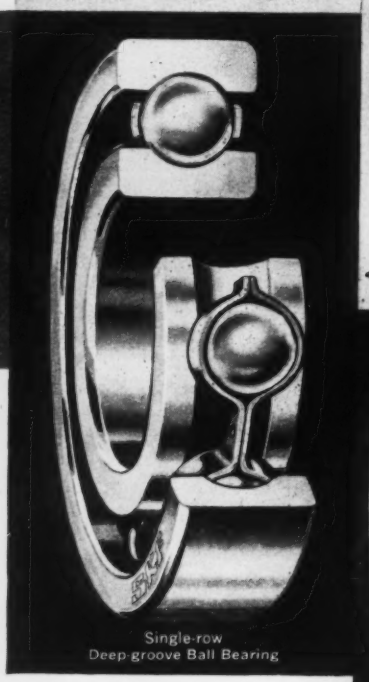
We even mass-produce some sizes of this particular bearing at our automated Altoona (Pa.) plant. You can buy quickly and economically. There are over 100 sizes ranging from over ⅝" O.D. to almost 16" O.D., with various seal, shield and snap-ring combinations.

But why not compare the quality, availability and price of this SKF bearing (or any of the other SKF products) with those you now use? For details, just call any of the 25 SKF sales offices. 5916


Spherical Roller Bearing


Timken® Tapered Roller Bearing


Cylindrical Roller Bearing


Single-row
Deep-groove Ball Bearing

Angular
Contact Bearing

Spherical Roller Thrust Bearing

Spherical, Cylindrical, Ball, and Timken® Tapered Roller Bearings

EVERY TYPE—EVERY USE

SKF®

SKF INDUSTRIES, INC., PHILADELPHIA 32, PA.

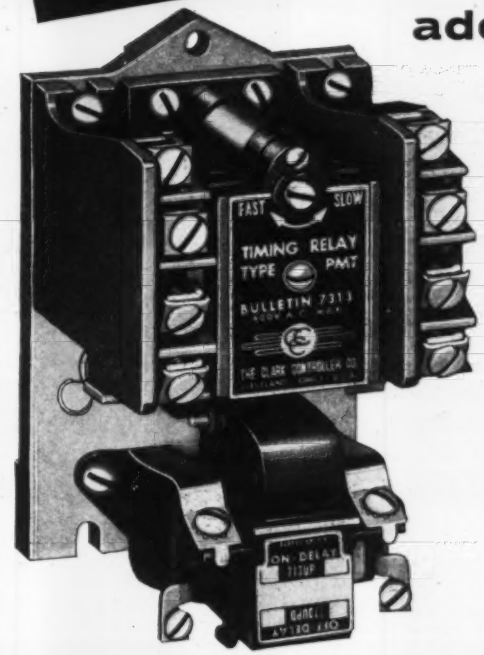
®REG. U. S. PAT. OFF.

NEW!

SPACE-SAVING

TWO CLARK RELAYS

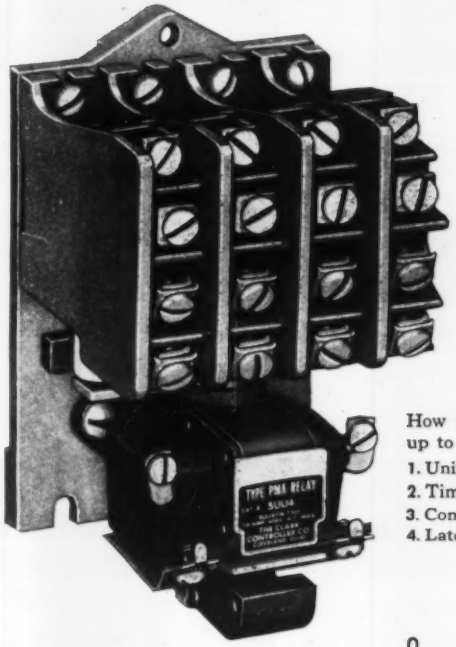
added to the "PM" Line!...



With the addition of *Time-Delay* and *Universal Pole* Relays to its "PM" line, Clark now offers *the most complete integrated line of control relays available today!* They have the same "modular" design and match physically the Convertible Pole (Type "PM") and Latch Relay (Type "PML").

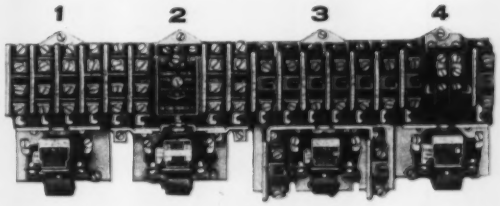
CLARK Type "PMT" TIME DELAY RELAYS

- Line up with other relays in the "PM" line.
- Timing head occupies space of 2 poles above magnet.
- Poles are "universal" type—each with 2 isolated contacts, one normally open, one normally closed, same as used on "PMA" relays described below.
- Available for "ON-DELAY" or "OFF-DELAY" operation (time delay after energization or de-energization). Easily convertible in the field.
- Timed and instantaneous poles are identical.
- Models available with either 2 or 4 timed contacts and up to 6 instantaneous contacts.



CLARK Type "PMA" UNIVERSAL POLE RELAYS

- Line up with other relays in the "PM" line.
- Each pole contains 2 isolated contacts—one normally open, one normally closed, with 600v clearance between contacts.
- Individual poles can be removed or replaced without disturbing others. Each pole has its own arcing chamber—any short circuit is confined to one pole.
- Poles are interchangeable with convertible poles of "PM" relays.
- Models available with up to 14 contacts per relay.



How Clark Relays line up to save panel space.
1. Universal Pole Relay
2. Time Delay Relay
3. Convertible Pole Relay
4. Latch Relay

Write for complete information

The **CLARK CONTROLLER** *Company*

Everything Under Control

1146 East 152nd Street • • Cleveland 10, Ohio

IN CANADA: CANADIAN CONTROLLERS, LIMITED • MAIN OFFICES AND PLANT, TORONTO

"Are you inferring that

I don't know the score

on my own operations?"

Charts and curves and bar-graphs have no more relation to reality than tea-leaves . . . *if* they are not drawn from accurate, current facts-in-figures on the operation of machines and processes.

And such facts-in-figures are readily available from Veeder-Root Counters that are easily attachable to your equipment. Inexpensive, too, for what they do . . . counting in terms of turns, strokes, pieces, lengths, volumes, impulses, shadows or any unit you want. Then you'll always *know the score* . . . down to the last decimal point, at any given moment. Let us figure how to do it. Write.

You always "Know the score" when you count on Veeder-Root!

NEW
High Speed, Quick Reset REVOLUTION COUNTER

This is one of scores of types of counters made by Veeder-Root for manual, mechanical and electrical counting. This counter runs at speeds up to 6,000 rpm . . . resets to zero with one flick of the lever. Also available with predetermining feature.

Everyone can Count on

Veeder-Root Inc.

Hartford 2, Connecticut

Hartford, Conn. • Greenville, S. C. • Altoona, Pa. • Chicago
New York • Los Angeles • San Francisco • Montreal

Offices and Agents in Principal Cities

This Week in STEEL

The Metalworking Weekly

April 13, 1959
Vol. 144 No. 15

EDITORIAL 49

Imports are forcing U. S. auto industry to revolutionize. One example: Big Three economy cars.

SPECIAL FEATURE 95

Keeping Wages in Line

You can't do it just by adhering to industry and area pay levels. You have to get a dollar's worth of output for a dollar's pay and you must maintain a good balance between employment and other costs, so that profit ratios are realistic.

WINDOWS OF WASHINGTON 62

With better tax breaks planned, more small and medium sized firms are interested in investing abroad.

MIRRORS OF MOTORDOM ... 69

From sports car to No. 2 in the luxury field in five years. That's the Ford Thunderbird story.

THE BUSINESS TREND 73

Most ground lost during the recession has been regained. We're heading into new territory.

WHERE TO FIND—

Behind the Scenes 6
Letter to the Editors 10
Editorial & Business Staffs 16
Calendar of Meetings 23
Men of Industry 77
New Products 131
New Literature 136
Advertising Index 169

Business—

METALWORKING OUTLOOK 43

Can Unions Find New Leadership to Solve Problems of 1960s? 51
Magnesium Output Off, but Second Producer Enters Field 53
New Market Guide Coming—Will list 30,000 metalworking plants 55
Atomic Swords Become Plowshares—Scientists describe new uses 56
Space Predictions by General Dynamics—They cover next decade 57
Depreciation Reform: Initial Writeoff?—Fifth in a series 58
Spring Auto Sales Bloom—5.5 million car year likely 60
Schools Can Handle Your Research—Provide readymade teams 61
Free Trade, Coal, Prices Dim Common Market Hopes 65
Inland Replacing Outmoded Rerolling Mill Equipment 83
Keeping Wages in Line—Managers suggest four ways to do it 95
No. 3 in STEEL's Program for Management for 1959

Production—

TECHNICAL OUTLOOK 105

Aluminum-Magnesium Alloys Move into Structural Field 106
Alloy Increases Life of Furnace Parts—It's Hastelloy X..... 110
Unit Dies Cut Downtime—Inserts can be changed in 20 minutes 112
Progress in Steelmaking—Stainless Steel Made Safer for Atomic Applications 114
High Strength Bolts Make High Quality Repairs 121
Machine Topics—Contoured Grinding Wheels Tackle Mill Rolls 122
"Right" Machines Boost Output, Cut Labor Costs 125
Standard Machines vs. Specials 128
Standard drill holds the cost line; special machine shows cost advantage

Markets—

MARKET OUTLOOK 139

Complete Index to Market News and Prices 139
In Decade, Re-bar Shipments Up 29%, but Imports Skyrocket 141
Steel Shipments for February—AISI report 143
Steelworks operation chart and district ingot rates 148
Decline In Scrap Is Slowing Down 160
Nonferrous Metals—Silver Price Won't Go Up 164

STEEL, the metalworking weekly, is selectively distributed without charge to qualified management personnel with administrative, production, engineering, or purchasing functions in U. S. metalworking plants employing 20 or more. Those unable to qualify, or those wishing home delivered copies, may purchase copies at these rates: U. S. and possessions and Canada, $10 a year; all other countries, $20 a year; single copies, 50 cents. Metalworking Yearbook issue, $2. Published every Monday and copyright 1959 by The Penton Publishing Co., Penton Bldg., Cleveland 13, Ohio. Accepted as controlled circulation publication at Cleveland, Ohio.

Index available semiannually. STEEL is also indexed by Engineering Index, 29 W. 39th St., New York 18, N. Y.

FIRST

NUMERI-TROL Tape Controlled Precision Profiling Machines

FIRST to provide 360° work rotation for 3-dimensional machining of complex parts

FIRST to combine grinding, dressing and dressing compensation with milling

Numeri-Trol slashes lead time, tooling cost and machining time of prototypes and precision parts; it ends the need for cams, templates or models.

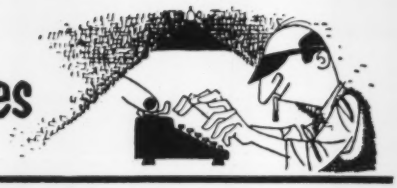
Features include tape-controlled grinding, rotary and longitudinal milling and 360° work rotation. Uses magnetic or punched tape systems. See your Ex-Cell-O Representative, or write direct.

58-51

XLO EX-CELL-O FOR PRECISION

EX-CELL-O CORPORATION DETROIT 32, MICHIGAN

behind the scenes



Polite Query Stirs Action

A western buddy of an old oriental potentate grew terribly excited when his host permitted him to view a dance staged by the entire harem. He waved his arms, rolled his eyes, and declared that he had never seen a cooler set of swingin' chicks. The shah stared at his guest in astonishment. "You mean, you think them old bags are the most? Why, I've been living with them for years, but if you rate them so high, maybe I haven't been giving them the appreciation they deserve."

We feel the same way about STEEL's market prices: We've been living with them for years, just taking them for granted; whereas they really rate appreciative attention. After you read this story, you'll appreciate them, too.

Tom Ballantine, STEEL's alert market research manager, opened a letter one morning this past winter. There was nothing unusual about his act; Tom often opens letters because if he didn't, he wouldn't know what was inside. The letter he opened that morning came from F. J. Bastl, A. O. Smith International S. A., home office of which is in Caracas, Venezuela. Mr. Bastl wanted the prices on 1 metric ton of 10 to 16 gage, hot-rolled sheets in Germany, Holland, and England, f.o.b. mill. He understood that additional charges were added to basic prices, depending on size and thicknesses. He also inquired whether the Coal & Steel Community determined the prices of steel for membership countries, or whether those countries were free to form their own price policy.

How would you like to open your morning mail, and encounter a question like that?

Operation SNAFU

Tom didn't battoir an oeil, as they say in Paris (because they don't know how to say bat an eye). He wrote immediately to the British Iron & Steel Corp., the Luria Steel Trading Co., the German American Chamber of Commerce, the Netherlands trade commissioner, and the U. S. Department of Commerce. Well, sir, you never saw such a run-around. Everybody referred the letter to higher authorities, who would place the inquiry in proper channels for handling.

The Luria Steel & Trading Co. wrote to their principals in London, The United Steel Cos. Ltd. They passed the buck—or, rather, the letter to the people at Ward & Kinghorn Ltd., who promised to get in touch with the Steel Co. of Wales. When the Luria people sent the reply from their London principals to Tom, they asked him to advise them regarding the last paragraph of the London letter, so Tom rushed down to the coffee shop for some black coffee to steady his nerves.

The British Iron & Steel Corp. politely reminded our shaking market research manager that Great Britain is not a member of the European Coal & Steel Community and politely suggested that he approach the High Authority at Luxembourg on the points raised in the third and fourth paragraphs of his letter. However, the company was kind enough to send a 1956 list of prices on heavy steel bars, steel sections, boiler plates, beams and columns but remained singularly mum on 10 to 16 gage, hot-rolled sheets.

The U. S. Department of Commerce got on the ball, though. The Commerce boys sent Tom a clipping from the *American Metal Market*, quoting the price of Japanese hot-rolled sheets. They added brightly that STEEL publishes base prices for imported steel from countries of the European Coal & Steel Community on a landed-at-a-U. S.-port, duty-paid basis. Minimum prices, they said, in the field of export are set by the Brussels Export Cartel, but after prices dropped below the agreed minimum, even the cartel sought divine guidance.

The best answer of all came from the American Institute for Imported Steel Inc. It said it didn't maintain a paid staff to handle this sort of thing, so it sent its regrets, which was mighty decent.

A Little Rough Stuff

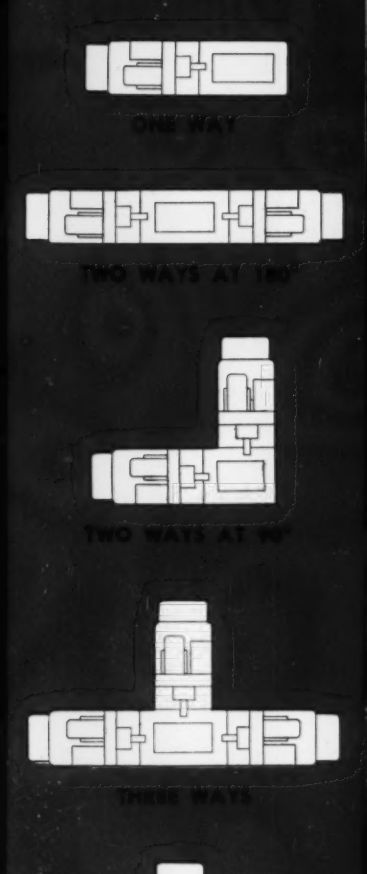
Before we leave winter for good, here is an answer to Kenneth W. Fowler, of Baltimore. Mr. Fowler was properly concerned about the Behr-Manning ad in the Feb. 11 STEEL, p. 17, featuring Metalite Abrasive Cloth. Much of the page area was covered with real abrasive, and Kenneth wanted to know about the hazards posed to printing presses by the abrasive material.

We checked with Carl Schafer, manager of Penton Press, and he said indeed the stuff did pose a hazard. The page was an insert, printed by another company. It was inserted into the Feb. 23 issue by hand, and he was glad the abrasive stuff didn't run beyond the edge of the page and require trimming.

When we asked if the trimming of abrasive material would cause any trouble, he looked at us strangely, and heaved a patient sigh before he murmured: "Dulls the knives, you know."

Shrdlu

(Metalworking Outlook—Page 43)



Ex-Cell-O 4-Way Machine precision bores four holes simultaneously, holding 90° angles.

7 ways to increase your production

Three new features on all Ex-Cell-O Way Machines give even greater production and precision

The diagrams at left tell a story.

Ex-Cell-O Way Machines using standard components in the combinations illustrated perform precision boring, turning, facing, grooving and chamfering operations economically and quickly. They take large work pieces in stride—the spindles move to the work.

In each machine three new features assure long life, dependable operation, and exceptional accuracy.

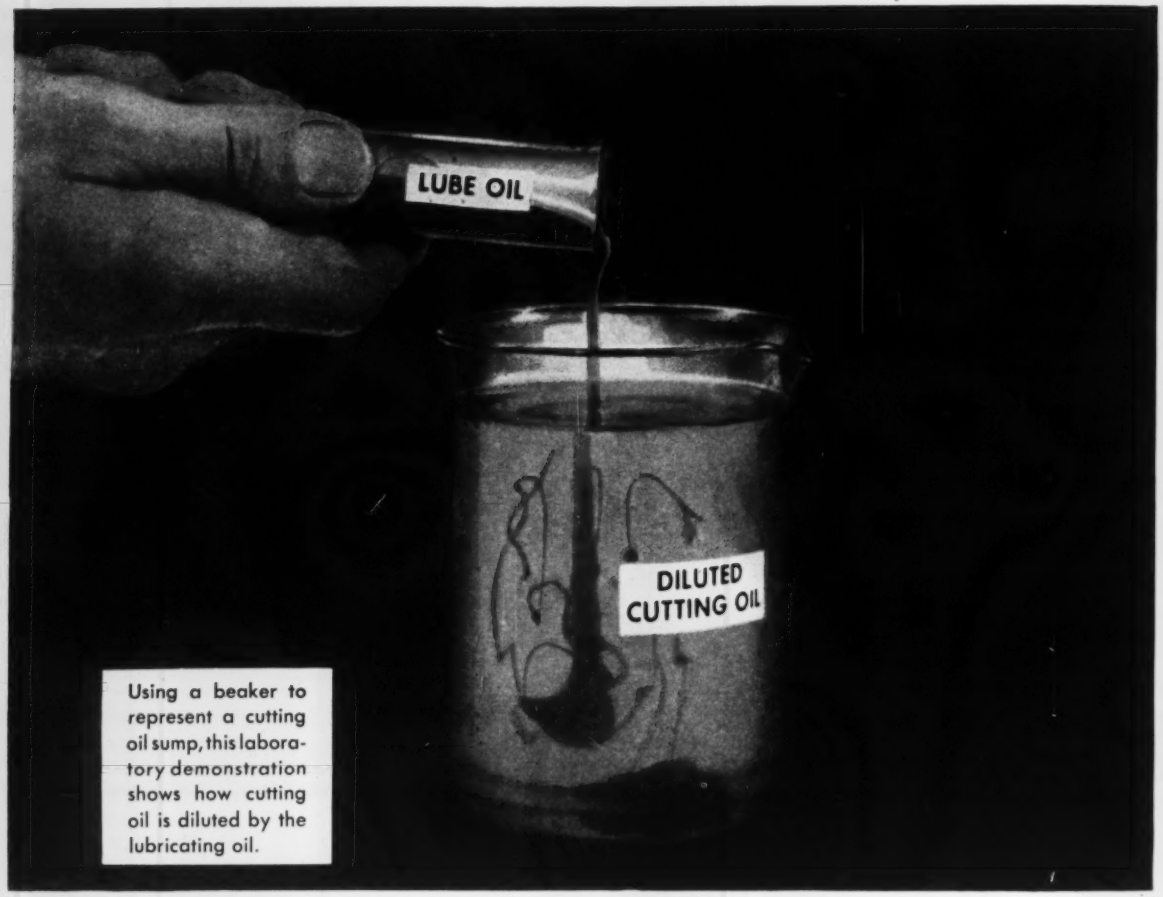
The features: (1) ways are hardened and ground, (2) slides are fully supported the length of the stroke, (3) hydraulic control panels give a wide range of automatic cycles.

Write Ex-Cell-O in Detroit for further information. Better still, call in an Ex-Cell-O representative.

EX-CELL-O CORPORATION
DETROIT 32, MICHIGAN
Machinery Division

DETROIT 32, MICHIGAN • Ex-Cell-O Precision Products Include: Machine Tools • Grinding and Boring Spindles • Cutting Tools • Railroad Pins and Bushings • Drill Jig Bushings • Torque Actuators • Thread and Groove Gages • Granite Surface Plates • Aircraft and Miscellaneous Production Parts • Dairy Equipment

56-44R



Using a beaker to represent a cutting oil sump, this laboratory demonstration shows how cutting oil is diluted by the lubricating oil.

Diluted cutting oil can cut output 33%

No matter how careful your lubricating techniques, you still can't stop lube oil from leaking into the cutting oil sump on 70% of automatic screw machines. As cutting oil is diluted, it loses strength—ingredients that make it efficient become less and less effective. The natural consequence is shortened tool life, more downtime and a higher percentage of rejects.

Texaco Cleartex can end this problem forever. All you have to do is use Cleartex for both cutting *and* lubrication . . . and watch your production rise. The exceptional chemical stability and load-carrying ability of the Cleartex series make them equally suitable for use as cutting oils, lubricants and hydraulic fluids. (70% of all automatic screw machines can benefit from the "Cleartex Cure!")

TAKE THE CLEARTEX CURE SOON!

Write today for your copy of Texaco's new booklet—"Cleartex in Automatic Screw Machines." This new illustrated guide will fill you in on the details, show you where you may be losing profits and how to avoid it . . . Or contact your local Texaco Lubrication Engineer soon for an authoritative survey of your automatics. Just call the nearest of more than 2,000 Texaco Distributing Plants, or write to The Texas Company, 135 East 42nd Street, New York 17, New York. Dept. S-FM-11.

LUBRICATION IS A MAJOR FACTOR IN COST CONTROL

(PARTS, INVENTORY, PRODUCTION, DOWNTIME, MAINTENANCE)

DOMESTIC SERVICE			INTERNATIONAL SERVICE	
Check the class of service desired; otherwise this message will be sent as a fast telegram			Check the class of service desired; otherwise the message will be sent at the full rate	
TELEGRAM			FULL RATE	
DAY LETTER			LETTER TELEGRAM	
NIGHT LETTER			SHORE-SHIP	

$ S E

WESTERN UNION TELEGRAM

1211 (4-55)

W. P. MARSHALL, PRESIDENT

NO. WDS.-CL. OF SVC.	PD. OR COLL.	CASH NO.	CHARGE TO THE ACCOUNT OF	TIME FILED
NIGHT LETTER	PAID		STEEL THE PENTON PUBLISHING CO. CLEVELAND 13, OHIO	

Send the following message, subject to Western Union Telegraph Company's conditions, rules and regulations which are on file with regulatory authorities.

NOTICE TO WESTERN UNION
Please send standard text plus fill-ins and items checked.

To _____
ADVERTISER

_____
ADDRESS

ATT. SALES MANAGER

Re your advertisement page ——, _____ STEEL
ISSUE DATE

Please:
- ☐ Send literature
- ☐ Send detailed cost figures
- ☐ Send specifications
- ☐ Send case histories
- ☐ Send customer names
- ☐ Have salesman call
- ☐ Telephone

_____ SIGNED

_____ TITLE

_____ COMPANY

_____ ADDRESS

_____ CITY, STATE

FOR MORE INFORMATION . . .

Send this Wire at Our Expense

This telegram blank is for your convenience in contacting any advertiser in this issue. Check the information you require, fill in name and address of advertisers, and sign your name, company and address. Send to your nearest Western Union office.

YOU MAY TELEPHONE your message to Western Union, or send it over direct Western Union wire. Telegram should be sent *"Prepaid Night Letter"* and charged to STEEL, The Penton Publishing Co., Cleveland 13, Ohio. *Do Not Send Collect.*

STEEL

DOMESTIC SERVICE			INTERNATIONAL SERVICE
Check the class of service desired; otherwise this message will be sent as a fast telegram	$ S E	WESTERN UNION TELEGRAM	Check the class of service desired; otherwise the message will be sent at the full rate
TELEGRAM		1211 (4-55)	FULL RATE
DAY LETTER			LETTER TELEGRAM
NIGHT LETTER		W. P. MARSHALL, PRESIDENT	SHORE-SHIP

NO. WDS.-CL. OF SVC.	PD. OR COLL.	CASH NO.	CHARGE TO THE ACCOUNT OF	TIME FILED
NIGHT LETTER	PAID		STEEL THE PENTON PUBLISHING CO. CLEVELAND 13, OHIO	

Send the following message, subject to Western Union Telegraph Company's conditions, rules and regulations which are on file with regulatory authorities.

NOTICE TO WESTERN UNION
Please send standard text plus fill-ins and items checked.

To _____
ADVERTISER

_____
ADDRESS

ATT. SALES MANAGER

Re your advertisement page ——, _____ STEEL
ISSUE DATE

Please:
- ☐ Send literature
- ☐ Send detailed cost figures
- ☐ Send specifications
- ☐ Send case histories
- ☐ Send customer names
- ☐ Have salesman call
- ☐ Telephone

_____ SIGNED
_____ TITLE
_____ COMPANY
_____ ADDRESS
_____ CITY, STATE

FOR MORE INFORMATION . . .

Send this Wire at Our Expense

This telegram blank is for your convenience in contacting any advertiser in this issue. Check the information you require, fill in name and address of advertisers, and sign your name, company and address. Send to your nearest Western Union office.

YOU MAY TELEPHONE your message to Western Union, or send it over direct Western Union wire. Telegram should be sent *"Prepaid Night Letter"* and charged to STEEL, The Penton Publishing Co., Cleveland 13, Ohio. *Do Not Send Collect.*

STEEL

"Our new Bliss makes 16 of these a minute...

...direct from coil stock." Automating bearing cage production was a key objective of the modernization program recently undertaken by The Timken Roller Bearing Company. And close cooperation between Bliss transfer feed specialists and Timken production men resulted in a press that does the work of a number of older ones—it automatically feeds heavy gage coil stock in and finished cages out—sixteen of them every minute. If more parts for less money is your pressing problem then by all means send for our illustrated transfer feed bulletin. It's packed with some unusual applications of the transfer principle. Perhaps there's an idea here for you...

BLISS
SINCE 1857

E. W. BLISS COMPANY • Canton, Ohio

BLISS is more than a name—it's a guarantee

PRESSES • ROLLING MILLS • ROLLS • DIE SETS • CAN MACHINERY • CONTRACT MFG.

An entire **NEW** Plant devoted exclusively to the making of **Precision BALLS**

. . . the best—Strom combines 40 years' experience with the most modern methods and machinery to produce the world's finest balls.

Balls of Chrome, Commercial-type Carbon and Stainless Steels, Brass, Bronze, Monel Metal, and Special Materials

Catalog and Prices on Request

Strom STEEL BALL CO.

Erwin, Tennessee · Telephone ERwin 2-1141

Pacific Coast Representative: R. J. SCHENK, 716 South Main Street, Santa Ana, California
Southwestern Representative: E. E. GRAHAM & Co., 3701 Navigation Blvd., Houston 3, Texas
Chicago Representative: ROBERT YOUMANS, 6110 West 26th Street, Chicago 50, Illinois

8548

LETTERS TO THE EDITORS

Article Helps Engineer

"Warmth of Color and Feel Added to Strength of Steel" (Mar. 9, p. 73) was most interesting and helpful. I would appreciate receiving another copy.

C. Werntz
Construction & Fabrication
Research Engineer
Hussmann Refrigerator Co.
St. Louis

• • •

We have viewed this article with interest. May we have two extra copies?

G. D. Marwick
Product Manager
General Sales Dept.
Robertson-Irwin Ltd.
Hamilton, Ont.

Enthusiasm Boosts Productivity

"Boosting Productivity" (Mar. 16, p. 104) was stimulating.

I agree wholeheartedly with William Ylvisaker's statement, "As long as managers are exposed to it (enthusiasm), productivity can't help but improve."

It is the spark of enthusiasm in a company that enables it to outstrip its competitors.

H. A. Joerger Jr.
Plant Engineer
Woodhaven Metal Stamping Co. Inc.
Brooklyn, N. Y.

• • •

The article is excellent. May we have two additional copies?

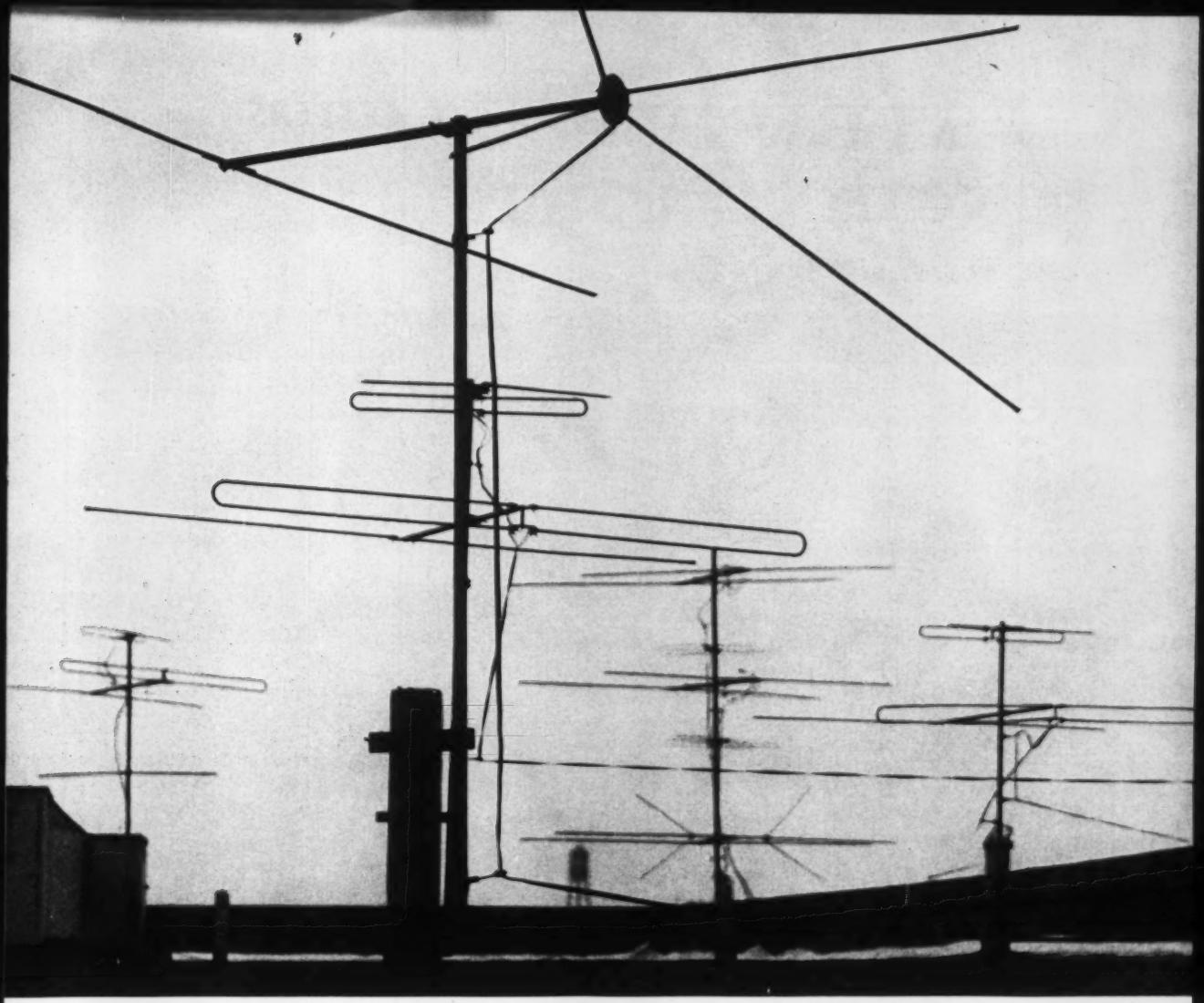
D. T. Foxcroft
General Manager
Westeel Products Ltd.
Toronto, Ont.

Good Summary of Economy

I have just reviewed a reprint from your Jan. 5 issue on "The Changing Role of Metalworking Managers" (p. 95). I would appreciate a copy for my own files.

This article offers a better summary and review of our changing economy in a small space than anything I have yet

(Please turn to Page 12)



WHICH ONES WILL LAST (and last, and last!)?
THOSE MADE OF WEIRKOTE® ZINC-COATED STEEL!

Steel tubing that's protected against corrosion even under the most trying circumstances. Steel tubing that's easily fabricated to meet the most exacting specifications.

That's what you get in tubing made of Weirkote zinc-coated steel!

Weirkote's zinc coating—applied by the continuous process throughout, and so uniformly that every square inch is protected—is skin-tight. There's absolutely no flaking or peeling no matter how tortuous the crimping, twisting or other stresses of fabrication. In fact, Weirkote can be worked to the very limits of the steel itself.

The use of Weirkote can eliminate the need for any further coating process after fabrication. Its tight zinc coating is completely intact and remains so during fabrication and on the job. Weirkote zinc-coated steel tubing is particularly suited for jobs where weather is a factor to be taken into consideration.

Take a good long look at the possibilities and advantages of using Weirkote zinc-coated steel to meet your tubing requirements. For the complete story on Weirkote and how it can help you, write Weirton Steel Company, Dept. B-7, Weirton, West Virginia.

WEIRTON STEEL COMPANY

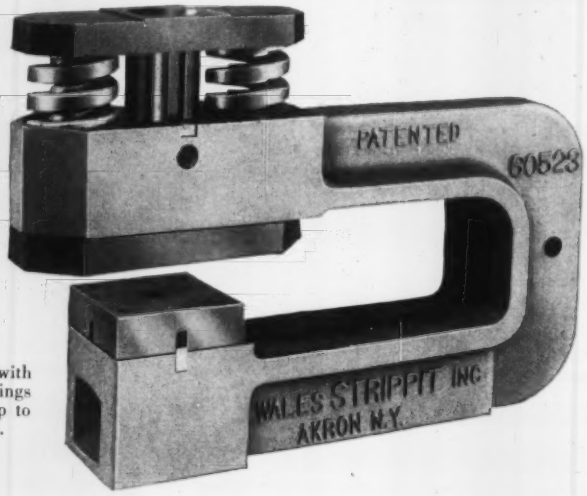
WEIRTON STEEL COMPANY

WEIRTON, WEST VIRGINIA

a division of

NATIONAL STEEL CORPORATION

new STRIPPIT PUNCHING UNITS with DUAL-RANGE capacity!



● Strippit unit with mechanical springs for piercing up to .250 mild steel.

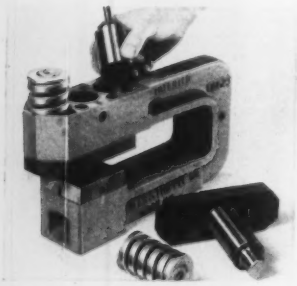
- Up to .250 mild steel, using removable Strippit mechanical springs
- Up to .750 mild steel, with interchangeable Strippit Hydra-Springs
- Convertible from .250 to .750 capacity in seconds, at minimum cost
- One heavy-duty holder for both capacity ranges
- Readily replaceable punch tips and dies — round, obround, square, shaped
- Keyed punch body keeps punches accurately aligned

USING STRIPPIT MECHANICAL SPRINGS

Max. punch dia.	Max. material thickness (mild steel)
1.375	.250
1.250	.375
1.125	.500

USING STRIPPIT HYDRA-SPRINGS

Max. punch dia.	Max. material thickness (mild steel)
1.375	.375
1.250	.500
1.125	.625
1.000	.750



◀ Mechanical springs are easily replaced with Hydra-Springs for punching up to .750 mild steel.

WRITE TODAY for the new Strippit General Catalog. It covers all details on this and all other Strippit units... plus the savings in tooling and press time effected with the famous cost-cutting Strippit System of fabrication.

WALES STRIPPIT INC.
210 Buell Road • Akron, New York

A UNIT OF HOUDAILLE INDUSTRIES, INC.

Manufactured in Canada by: Strippit Tool & Machine Company, Brampton, Ont.

LETTERS

(Concluded from Page 10)

seen, and you are to be complimented on the lucid presentation.

Have you ever paralleled the review of inflation with the amount of direct and indirect taxes which a wage earner must pay? I realize there is a real need for some of these taxes, but I believe your readers would be amazed if they took the simple article called garbage can and traced back to the original source of raw material and identified direct taxes and portions of cost represented by personal income taxes paid on wages through the whole cycle of production and distribution necessary to put this simple item in the hands of a using family. Think how far more complex and greater that amount is on the automobile purchases. Do you suppose there are any economists or legislators with enough foresight to ever see a way to reduce this without floundering the nation's and the world's economy?

Warner A. Johnson
Co-ordinator of Sales Training
Micro Switch Div.
Minneapolis-Honeywell Regulator Co.
Freeport, Ill.

Wants Information on Alloys

In Technical Outlook (Jan. 19, p. 61) there was an item on "Light Armor" which mentioned new fabricating methods for magnesium-lithium alloys. I have an interest in such alloys and if any more information exists on this, I would appreciate your making it available to me.

Richard J. Dvorak
Metallurgical Research
Chrysler Corp.
Detroit

• *We suggest you write to Jack A. Miller, Public Relations, Armour Research Foundation, Illinois Institute of Technology, 35 W. 33rd St., Chicago 16, Ill.*

Seeks MAPI Formula

In the article, "Can You Justify Old Equipment?" (Mar. 2, p. 118), we noted a reference to the Machinery & Allied Products Institute's formula. Will you advise us of the address of the institute so we may obtain a copy of this formula?

E. S. Wellhofer
Plant Manager
American Chain & Cable Co. Inc.
Wilkes-Barre, Pa.

• *The address is 1200 18th St. N.W., Washington 6, D. C.*

Traffic League Lauds Article

Our congratulations for the fine article, "Trafficmen: Unsung Assets" (Mar. 16, p. 74).

Lester J. Dorr
Executive Secretary
National Industrial Traffic League
Washington

NOW... weather reports from space

Already much valuable weather information has been radioed back by our weather station in the sky. "Beeped" to us by electronics, the data are processed by electronics, and of course acted upon by electronics.

Without modern electrical insulating materials, with the outstanding thermal and electrical properties of CDF products, we couldn't hope for these reports from space.

FOR SPECIFIC INFORMATION on CDF products, see Sweet's Electronics Buyers' Guide, and other directories. Then send us your print or your problem, and we'll recommend the proper material for your needs.

CDF MAKES Dilecto® Laminated Plastics • Di-Clad® printed-circuit bases • Celoron® and polyester-glass molded products • Micabond® mica products • Diamond® Vulcanized Fibre • Vulcoid® resin-impregnated fibre • Flexible tapes of duPont "Teflon" TFE fluorocarbon resin, Micabond®, and Silicone. *Enjoy CDF's complete plastics-fabrication facilities.*

CONTINENTAL-DIAMOND FIBRE
A SUBSIDIARY OF THE Budd COMPANY • NEWARK 22, DEL.
In Canada: 46 Hollinger Road, Toronto 16, Ont.

REPUBLIC ROLL-OVER TYPE SKID BOXES

speed up truck shipments at Jernberg Forgings Company

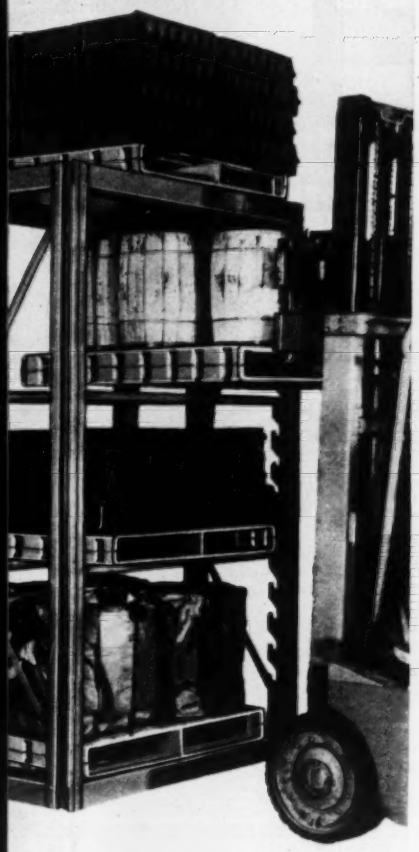
Saving time, money, and storage space! The Jernberg Forgings Company, Chicago, Illinois, is another company that has gone to Republic Skid Boxes adapted for roll-over and crane handling.

Jernberg, a major producer of automotive transmission parts, uses 200 such boxes for storage and subsequent loading of finished forgings into trucks for shipment. They've found that one man now loads a truck in less time than was required by using previous methods.

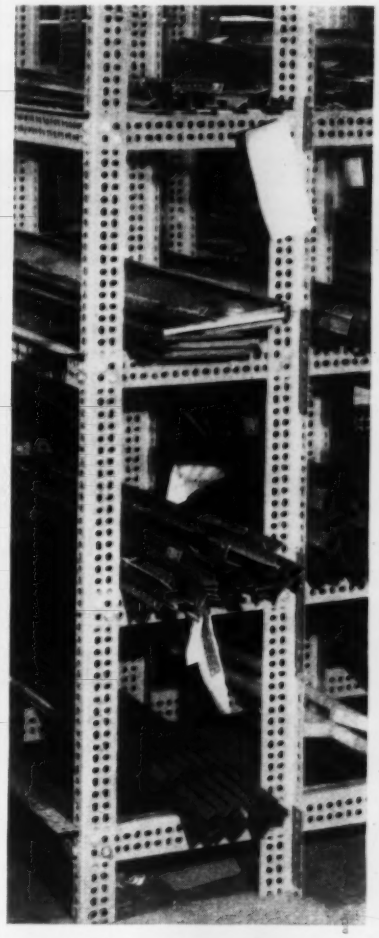
Another 200 boxes—¾ standard size—are used for collection and storage of 3,200-pound loads of cold-sheared forging billets. Despite the extreme weight, Jernberg stacks the boxes high, reducing storage space requirements. This helps save time, too.

Stacking does not damage the boxes. Rugged, corrugated construction and heavy-duty stacking brackets permit tiering to any practical height... assure long, efficient service at lowest overall cost. In addition, four-way fork channels simplify handling in restricted space. Smooth channel around the top eliminates sharp edges.

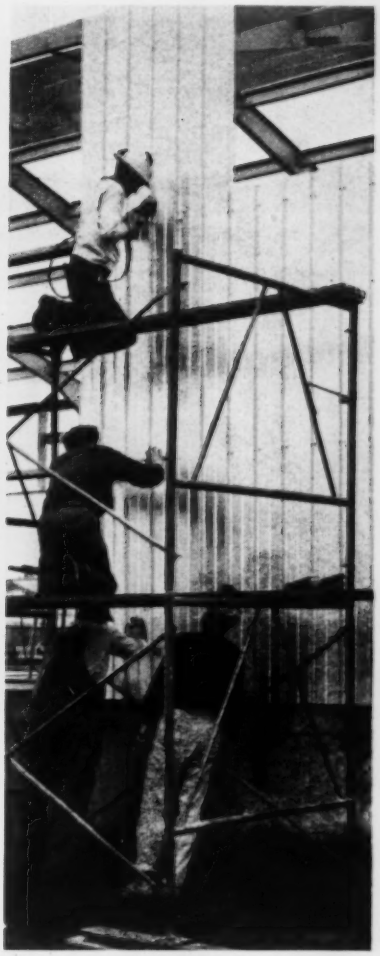
Like the Jernberg Forgings Company, you'll find that the materials handling engineers of Republic's Berger Division can help you save time, money, and storage space in your plant. Let them work with you in solving your materials handling problems. Call your Republic representative or write direct.



REPUBLIC STEEL PALLET RACKS save space and simplify palletizing and stacking of bulky, uneven, odd-lot and fragile materials. Tubular steel supports adjust every six inches to handle palletized material of any height. Two-way entry permits loading and unloading from either side. Select single pallets from any level without restacking. Write for complete description, specifications, and quotations. Or, have a Materials Handling Engineer call.



REPUBLIC METAL LUMBER® saves time, space, and money. Precision engineered system of short slots placed to allow ¾" vertical and horizontal adjustment, offers unlimited applications. Simply measure, cut, and assemble. Delivered in bundles of 10 angles, .080 gage or .104 gage, 10- or 12-foot lengths, bolts and nuts included. Stores in space of one 2" x 4" piece of lumber. Bonderized to resist rust. Baked enamel finish. Mail coupon for idea-packed catalog.



TRUSCON "BUDGET BUILDINGS" . . . 3-WEEK DELIVERY from order to job site! Here's top utility at lowest cost—the fast, easy way to provide industrial housing or to enlarge manufacturing facilities. "Budget Buildings" are available in widths of 12, 16, 20, 24, and 28 feet—in heights of 10 and 12 feet; and in widths of 32, 36, 40, 44, and 48 feet—12- and 14-foot heights, in any length necessary. Roofing, siding, windows, doors, hardware shipped as a package. Send coupon for brochure.

REPUBLIC STEEL

World's Widest Range of Standard Steels and Steel Products

REPUBLIC STEEL CORPORATION
DEPT. ST-7595
1441 REPUBLIC BLDG. • CLEVELAND 1, OHIO

☐ Have a materials handling engineer call.
Please send more information on:
☐ Republic Materials Handling Equipment
☐ Steel Pallet Racks
☐ METAL LUMBER
☐ Truscon "Budget Buildings"

Name _____ Title _____

Company _____

Address _____

City _____ Zone ____ State _____

QUANTITY PRODUCTION OF GREY IRON CASTINGS

ONE OF THE NATION'S LARGEST AND MOST MODERN PRODUCTION FOUNDRIES

ESTABLISHED 1866

THE WHELAND COMPANY

CHATTANOOGA 2, TENN.

WARD STEEL CO.

We specialize in
FINISHED STEEL
BARS—TUBES—STRIP

PROMPT WAREHOUSE SERVICE ONLY

Most Complete Stock in America of
BLUE TEMPERED SPRING STEEL

We believe that the way to sell is to carry a stock which permits satisfying any reasonable warehouse demand.

87A Rindge Ave. Ext. Phone UN 4-2460
CAMBRIDGE 40, MASS.

Branch:
3042-3058 W. 51st Street, CHICAGO, ILL.
Phone: Grovehill 6-2600

STEEL
The Metalworking Weekly

Editor-in-Chief, IRWIN H. SUCH

Editor, WALTER J. CAMPBELL

Associate Managing Editors, VANCE BELL, JOHN S. MORGAN

WILLIAM M. ROONEY .....Market Editor
ROBERT F. HUBER .....Machine Tool Editor
HARRY CHANDLER .....Copy Editor
GLENN W. DIETRICH....Associate Copy Editor
FRANK R. BRIGGS .....Associate Editor
ROBERT O. JAYNES .....Associate Editor
AUSTIN E. BRANT .....Associate Editor
ROSS WHITEHEAD .....Associate Editor
GEORGE J. HOWICK .....Associate Editor

DERRY EYNON .....Assistant Editor
NEIL C. ROBERTS .....Assistant Editor
DONALD E. HAMMERSTROM..Assistant Editor
JOHN TERESKO .....Assistant Editor
WILLIAM M. OLDS .....Assistant Editor
MARY T. BORGERHOFF .....Assistant Editor
MARY ALICE EARLY .....Assistant Editor
EILEEN CORTES .....Assistant Editor
MARY ANN STUVE .....Editorial Assistant

JANE WEDGE, Editorial Assistant

THOMAS H. BRYAN, TOM WELSH, Art Editors

IRENE KASNER, Editorial Service

Resident Editors

New York 17 .....60 E. 42nd St.
B. K. PRICE, L. E. BROWNE
BRIAN WILSON, H. GLENN CANARY
Murray Hill 2-2581

Chicago 11 .....520 N. Michigan Ave.
ERLE F. ROSS, WILLIAM E. DEAN
Whitehall 4-1234

Pittsburgh 19 .....2837 Koppers Bldg.
WILLIAM V. WALLACE—Atlantic 1-3211

Detroit 35 .....15800 W. McNichols Rd.
A. DONALD POSTMA—Broadway 3-8150

Washington 4 ....1123 National Press Bldg.
JOHN R. BOTZUM—Executive 3-6849

Editorial Correspondents

Buffalo—Emerson 5385 ....GEORGE E. TOLES
Youngstown—Riverside 7-1471..GEO. R. REISS
Cincinnati—Beechmont 1-9607...DICK HAVLIN
Birmingham—Birmingham 3-1121 R. W. KINCEY
St. Louis—Garfield 1-1212. HAMILTON THORNTON
Houston—Hudson 6-5236 .....ROBERT SHIRK

Los Angeles—Webster 5-1234..NORMAN LYNN
San Francisco—Yukon 6-5151 EDWIN HAVERTY
Seattle—Melrose 2-1895 .....R. C. HILL
Toronto, Canada—Empire 4-9655..F. S. TOBIN
Birmingham, England .....J. A. HORTON
Brussels, Belgium .....PAUL DE KEYSER

Dusseldorf, Germany, DR. HERBERT GROSS

BUSINESS STAFF

Business Manager, D. C. KIEFER

Asst. Business Mgr.....C. A. TALLINGER JR.
Advertising Service Mgr. ...DORIS MITCHELL
Production Manager .....A. V. ANDERSON
Classified Advertising .....EVELYN DIETZ

Promotion Director .....S. F. MARINO
Market Research Mgr. ....T. M. BALLANTINE
Circulation Director .....J. C. GERNHARD
Distribution Manager .....G. R. EBERSOLE

Reprints, JUNE SCHILENS

Advertising Representatives

New York 17 .....60 E. 42nd St.
K. A. ZOLLNER, GUY LABAW
Murray Hill 2-2581

Wynnewood, Pa. (Phila.) 200 Wynnewood Ave.
WM. J. VERSCHOOR—Midway 2-6512

Farmington, Conn. .....12 Farmstead Lane
CALVIN FISHER JR.
Orchard 7-1756

E. Rochester, N. Y. .....217 Ridgeview Dr.
HAROLD A. DENNIS—Browning 1-2105

Pittsburgh 19 .....2837 Koppers Bldg.
J. C. SULLIVAN—Atlantic 1-3211

Cleveland 13 .....Penton Bldg.
J. K. GILLAM, N. W. MANNING—Main 1-8260

Cincinnati 6 .....2215 Victory Parkway
E. L. FRANKE—Parkway 1-0711

Detroit 35 .....15800 W. McNichols Rd.
DONALD C. HYDE
Broadway 3-8150

Chicago 11 .....520 N. Michigan Ave.
L. C. PELOTT, W. L. POLAND
WM. J. D'ALEXANDER, RICHARD BIRDSONG
Whitehall 4-1234

Los Angeles 36 .....5943 W. Colgate Ave.
F. J. FULLER—Webster 1-6865

San Francisco 4 .....57 Post St.
Robert W. Walker Co.—Sutter 1-5568

Griffin, Ga. .....1106 Pine Valley Rd.
FRED J. ALLEN—Griffin 7854

Clearwater, Fla. .....1954 Jeffords Dr.
H. G. ROWLAND—(Clearwater) 39-9493

Dallas 35 .....818 Exchange Bank Bldg.
JAMES H. CASH—Fleetwood 1-4523

BPA

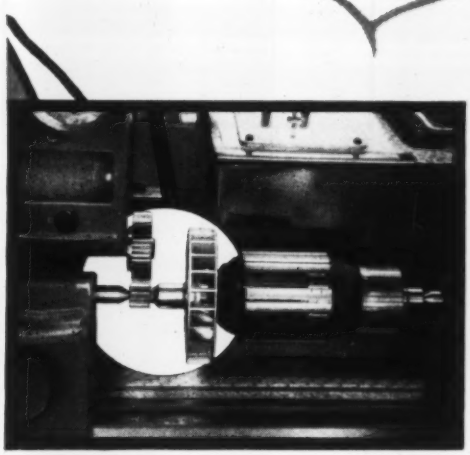
Published Every Monday by
THE PENTON PUBLISHING CO., Penton Bldg., Cleveland 13, Ohio
MAin 1-8260

GEORGE O. HAYS .....Chairman
RUSSELL C. JAENKE .....President
FRANK G. STEINEBACH .....Vice President and Secretary
FRANK O. RICE .....Vice President
JOSEPH P. LIPKA .....Treasurer and Assistant Secretary

NBP

Also Publisher of
FOUNDRY, MACHINE DESIGN, NEW EQUIPMENT DIGEST, AUTOMATION
Member of Business Publications Audit of Circulation Inc., Society of Business Magazine Editors, and National Business Publications Inc.

GEARED to give lightweights heavyweight power!



Fellows Inspection Instrument checks gear at a major gear-motor manufacturer. Integrated Fellows production and inspection equipment assures dependable quality control.

Power used to mean *weight*, too, but not any more; modern gear-motors pack immense power in a small volume, deliver maximum output per pound. Light executive aircraft use powered accessories only large planes could carry ten years ago. Products as diverse as home appliances and machine tools have grown steadily more powerful while shrinking in size and weight.

Accurate, dependable gears produced on Fellows equipment are essential to the performance of many of these mighty midgets. Their operation must be relatively smooth and quiet, even with the high reduction ratios required in many of them. Here, as in many other applications, Fellows Gear Shapers combine accuracy with production speed and low unit cost.

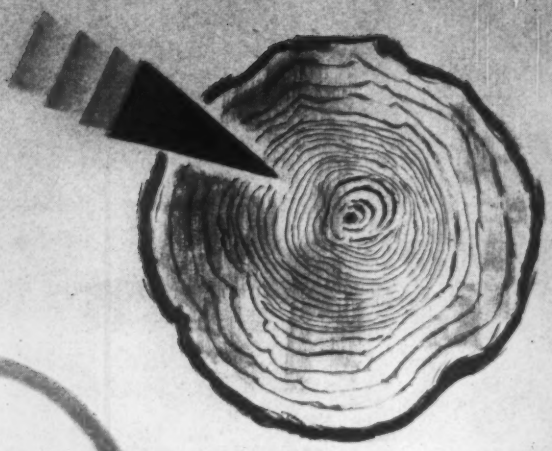
Your own gear production needs, from 1/16" to 120" pitch diameter, can probably be met more efficiently and profitably with Fellows equipment. For full information, get in touch with any Fellows office.

THE FELLOWS GEAR SHAPER COMPANY
78 River Street, Springfield, Vermont
Branch Offices:
1048 North Woodward Avenue, Royal Oak, Mich.
150 West Pleasant Avenue, Maywood, N. J.
5835 West North Avenue, Chicago 39
6214 West Manchester Avenue, Los Angeles 45

THE PRECISION LINE

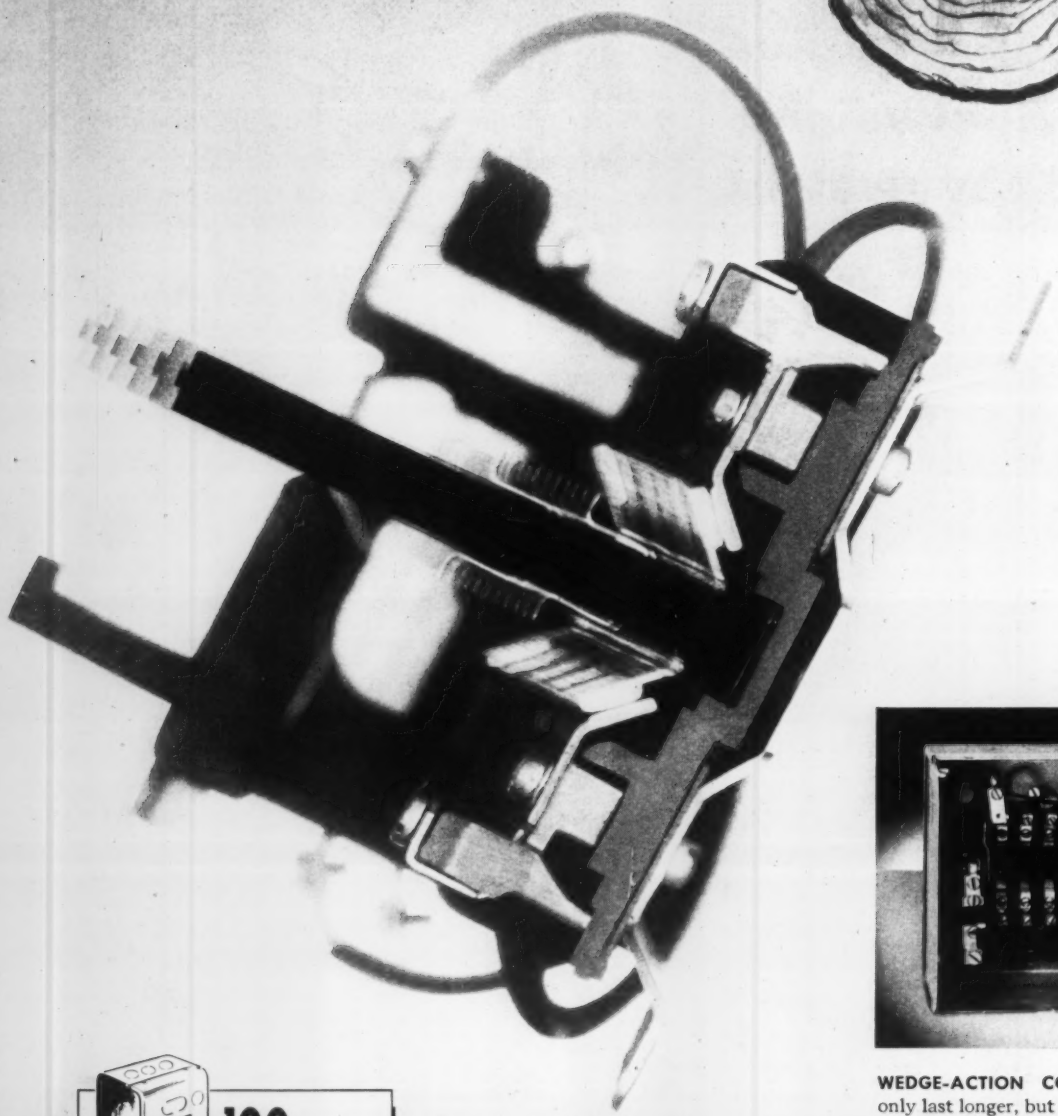
Fellows *Gear Production Equipment*

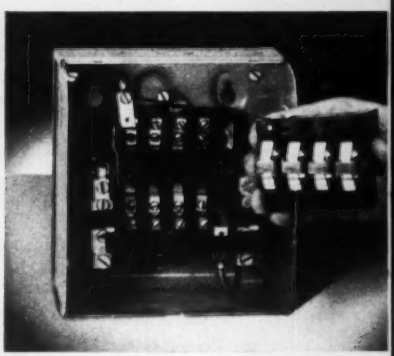
Exclusive G-E "wedge-action" contact design



JUST AS A WEDGE DRIVEN INTO A LOG is held tightly by pressure . . . the wedge-action contacts of G-E 100-Line magnetic starters move into position with *less bounce*. Result: less arcing and longer contact life.

CROSS-SECTION CUTAWAY ENLARGED APPROXIMATELY 30%





WEDGE-ACTION CONTACTS not only last longer, but can be visually inspected in 10 seconds *without* tools. Contact maintenance is thus held to the minimum.

contributes to G-E 100-Line magnetic starters'...

BETTER PERFORMANCE

The basic function of a magnetic starter is simply to open and close contacts. The better it performs this function, the greater its reliability. Here's why General Electric's 100-Line starter contact design gives you ***better*** contact fidelity and ***longer*** contact life:

POSITIVE "MAKE"—wedge-action contacts can move only forward and back; lateral movement is virtually impossible. This assures perfect contact alignment, positive "make," and longer contact life.

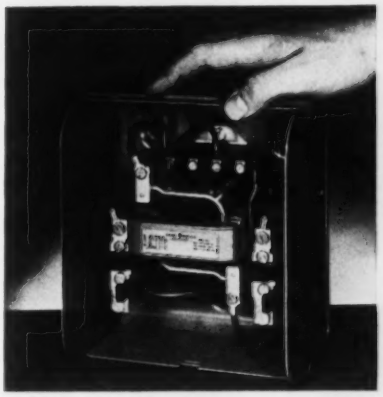
LESS BOUNCE—less armature mass and spring-loaded contacts that absorb the shock of contact mean minimum bouncing or arcing—the major cause of contact failure. Spring-loaded contacts also help prevent contact welding and assure high tip pressure.

POSITIVE "BREAK"—contact springs and a low stress "kick-off" spring in the contact arm assure fast, positive break.

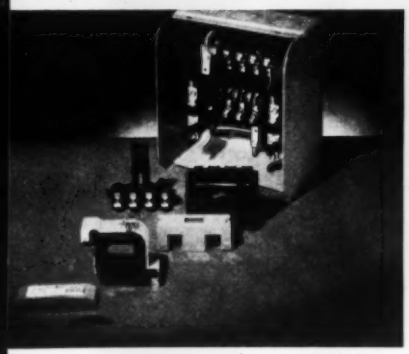
LESS CONTAMINATION—because of their vertical slant design, G-E 100-Line starter contacts shrug off dust and dirt—help keep starter performing better.

FOR BETTER PERFORMANCE AND LESS MAINTENANCE, specify G-E 100-Line magnetic starters—Sizes 0 and 1. Call your G-E Apparatus Sales Office or Distributor, or write Section 733-44, General Electric Co., Schenectady, N. Y.

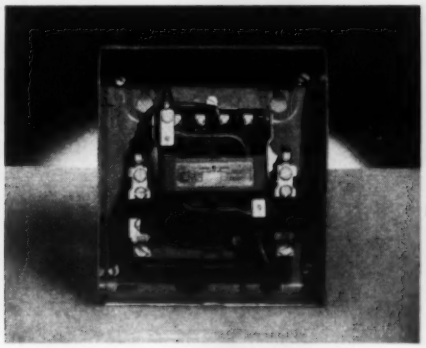
GENERAL ELECTRIC



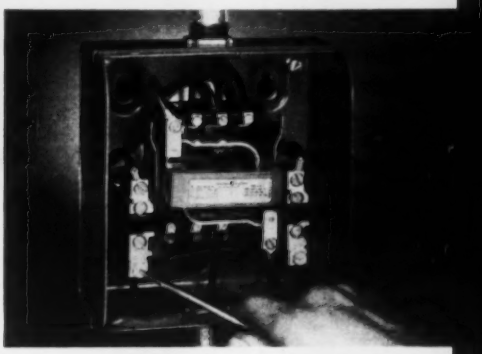
GENERAL ELECTRIC 100-LINE STARTERS are available in Sizes 0 and 1 with a wide variety of forms and enclosures.



SNAP-SLIDE CONSTRUCTION permits complete starter disassembly in 20 seconds without tools. All operating parts either snap or slide together for maximum accessibility.



32% MORE WIRING ROOM makes the G-E 100-Line starter easier to wire, even though it's smaller in size than previous forms. Wrap-around cover adds extra accessibility.



STRAIGHT-THROUGH WIRING with line terminals on top and load terminals on bottom saves wiring time. All wiring is done from front, and no wires need be bent or looped.

SANDVIK

Keeps A *Scientific* Eye On

SPRING STEEL QUALITY

Control of steel purity. The SANDVIK laboratories carry out more than 200,000 chemical analyses a year.

Research microscope for up to 2,000X enlargements. This microscope is also used for the study of structures, control of heat treatments, macrophotography etc.

At Sandvik, the latest scientific research and quality control techniques constantly improve and protect spring steel quality.

This is part of the reason why Sandvik steels have the special physical stamina to give consistent performance in such critical applications as flapper valves, instrument springs, shock absorbers, surgical instruments, unbreakable watch mainsprings, piston ring segments and expanders, etc.

Sandvik stocks a wide variety of grades and sizes of cold rolled specialty strip steels. For information on leading types, send for this free brochure.

SANDVIK STEEL, INC.

1702 Nevins Road, Fair Lawn, N. J.
SWarthmore 7-6200 • N.Y.C. ALgonquin 5-2200
Branch Offices:
Cleveland • Detroit • Chicago • Los Angeles
SANDVIK CANADIAN LTD.
P.O. Drawer 1335, Sta. O. Montreal 9, P. Q.
Works: Sandviken, Sweden

SPRING STEEL

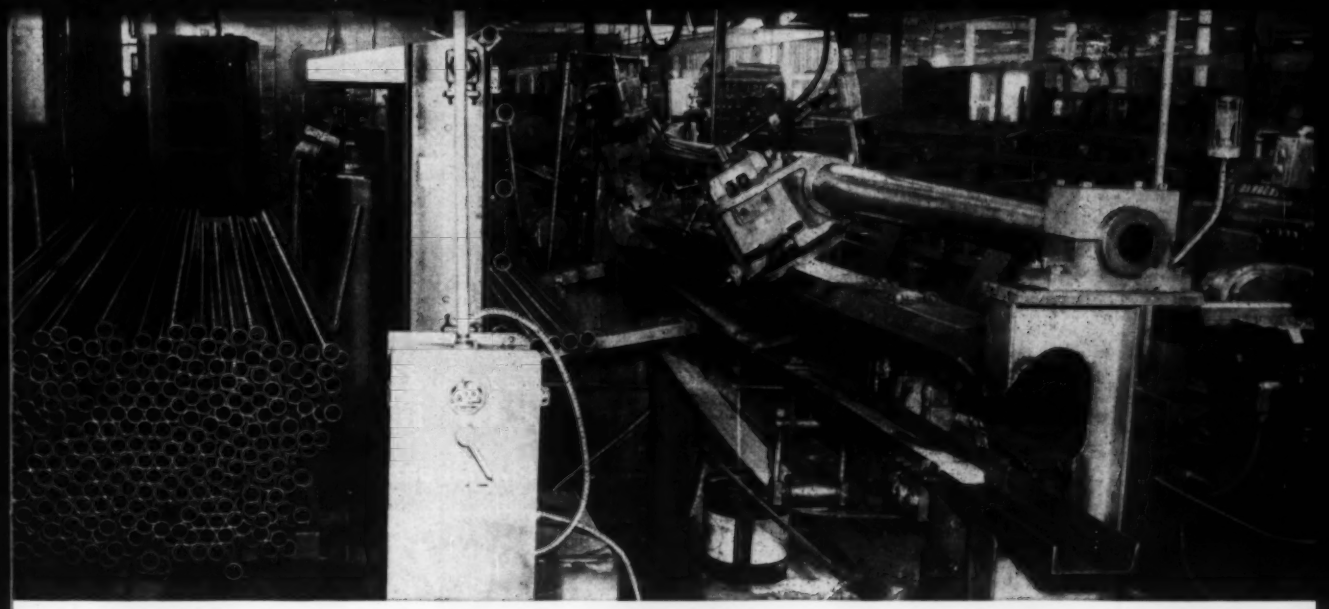
SPRINGS

CORONANT CARBIDE TOOLS

STEEL BELT CONVEYORS

HAND SAWS & TOOLS

SS-191

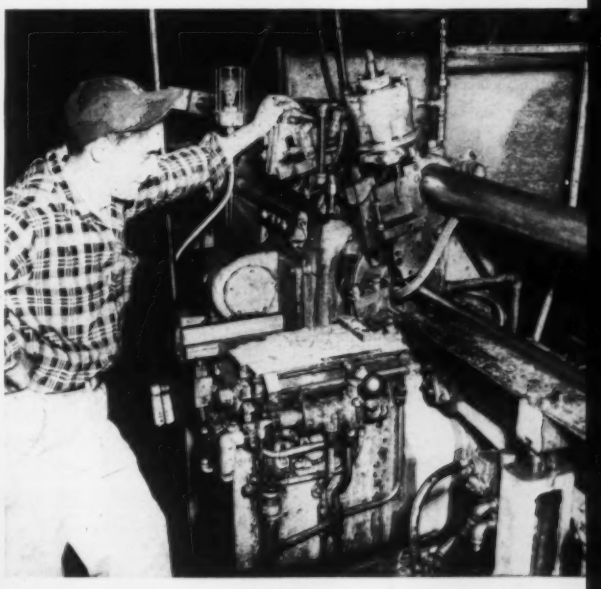


"Flexible Automation"

WITH BARDONS & OLIVER CUTTING-OFF LATHES

at Falls Steel Tube & Manufacturing Co., Newton Falls, Ohio

At Falls Steel Tube & Mfg. Co., manufacturers of exhaust pipes, tail pipes, and similar automotive tubular parts, the output of two electric weld tube mills is automatically transferred to three Bardons & Oliver loading tables. The tubing is then fed into three Bardons & Oliver Cutting-Off Lathes and automatically cut off in any required length from 6 inches to 10 feet. The cutoff lengths are automatically unloaded into tote trucks. Besides wide variance in length, tubing diameters vary from ½ to 3 inches and wall thickness from 14 to 20 gauge.



Victor Beltram, Chief Engineer, reports labor reduced by 75% and cutoff capacity increased by 50% with the Bardons & Oliver installation. Previously, cutoff operations were performed on circular sawing machines. The cutting-off lathes produce square ends and smooth finishes which have greatly facilitated secondary operations. The increased cutoff capacity has allowed greater utilization of all plant facilities. The complete Bardons & Oliver installation has paid for itself in less than three years.

If you cut off spacers, bushings, nipples, couplings, rollers, similar tubular products, or solid bar stock, we suggest you explore the profit possibility offered by these versatile machines. Bardons & Oliver manufactures a complete line of Cutting-Off Lathes ranging in collet capacity from 2 to 16 inches.

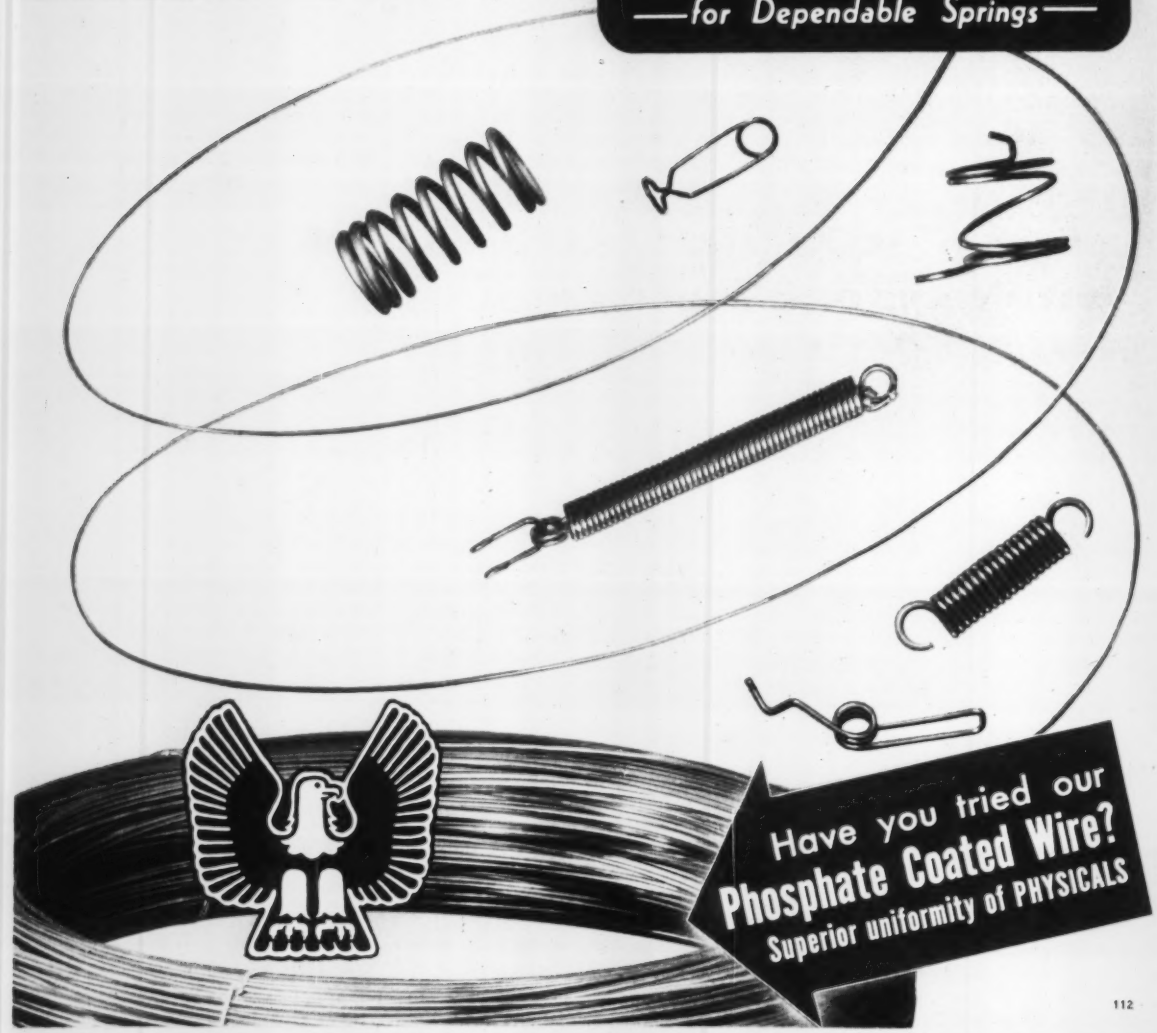
BARDONS & OLIVER

BARDONS & OLIVER, INC., 1147 WEST 9th ST., CLEVELAND 13, OHIO

Manufacturers of Turret Lathes and Cutting–Off Lathes

Made by skilled craftsmen from
WASHBURN STEEL
its Uniformly Superior Quality insures the Dependability of your springs. *Famous for years.*

Eagle Music Wire
—for Dependable Springs—



Have you tried our
Phosphate Coated Wire?
Superior uniformity of PHYSICALS

112

WASHBURN

WASHBURN WIRE COMPANY, NEW YORK CITY

CLEAN, UNIFORM BILLETS - STRIP - RECTANGULAR, ROUND, FLAT RODS
TEMPERED AND UNTEMPERED FLAT AND ROUND HIGH CARBON WIRES

CALENDAR
OF MEETINGS

Apr. 13-17, American Foundrymen's Society: Annual meeting and engineered castings show, Sherman and Morrison Hotels, Chicago. Society's address: Golf and Wolf Roads, Des Plaines, Ill. General manager: W. W. Maloney.

Apr. 13-17, American Management Association: National packaging exposition, International Amphitheatre, Chicago. Association's address: 1515 Broadway, New York 36, N. Y.

Apr. 14-16, Steel Shipping Containers Institute Inc.: Annual meeting, Miami Beach, Fla. Institute's address: 600 Fifth Ave., New York 20, N. Y. Secretary: L. B. Miller.

Apr. 16-17, American Institute of Steel Construction: National engineering conference, Dinkler-Tutweiler Hotel, Birmingham. Institute's address: 101 Park Ave., New York 17, N. Y. Executive vice president: L. Abbett Post.

Apr. 16-17, Magnesium Association: Spring meeting, Congress Hotel, Chicago. Association's address: 122 E. 42nd St., New York 17, N. Y. Executive secretary: Jerry Singleton.

Apr. 18-22, American Society of Tool Engineers: Annual meeting, Schroder Hotel, Milwaukee. Society's address: 10700 Puritan Ave., Detroit 38, Mich. Executive secretary: Harry E. Conrad.

Apr. 19-23, American Society of Mechanical Engineers: Oil and gas power division conference and exhibit, Shamrock-Hilton Hotel, Houston. Society's address: 29 W. 39th St., New York 18, N. Y. Secretary: O. B. Schier.

Apr. 20-22, Metal Powder Industries Federation: Annual meeting and powder metallurgy show, Sheraton-Cadillac Hotel, Detroit. Federation's address: 130 W. 42nd St., New York 36, N. Y. Executive secretary: Kempton H. Roll.

Apr. 21-23, American Society of Lubrication Engineers: Annual meeting, Statler-Hilton Hotel, Buffalo. Society's address: 84 E. Randolph St., Chicago 1, Ill. Administrative secretary: Calvert L. Willey.

Apr. 21, Material Handling Institute Inc: Membership meeting, Sheraton-Cleveland Hotel, Cleveland. Institute's address: 1 Gateway Center, Pittburgh 22, Pa. Managing director: L. West Shea.

Apr. 22-26, Metal Treating Institute: Spring meeting, Hollywood Beach Hotel, Hollywood, Fla. Institute's address: 271 North Ave., New Rochelle, N. Y. Executive secretary: C. E. Herington.

the right screwdriving bit can determine your fastening costs

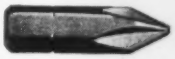
The *right* screwdriving bit is designed for a specific screw size, then hardened and tempered for a specific type of screwdriving application.

With the *right* bit you'll assemble more products in less time, have fewer rejects, and drive more screws per bit.

The *right* screwdriving bit for your application will be found in Catalog 30-C, along with the complete line of Apex screwdriving tools . . . for use with all established makes of drivers . . . to drive Phillips, Frearson (Reed & Prince), Slotted, Clutch Head, Socket Head, Hex Head and even special types of screws. Write, on your company letterhead, for your copy.

APEX INSERT BITS (Used with Apex Bit Holders)
for Phillips cross-recessed-head screws and bolts

POINT SIZES: #0 through #4


440 Series
Standard Length

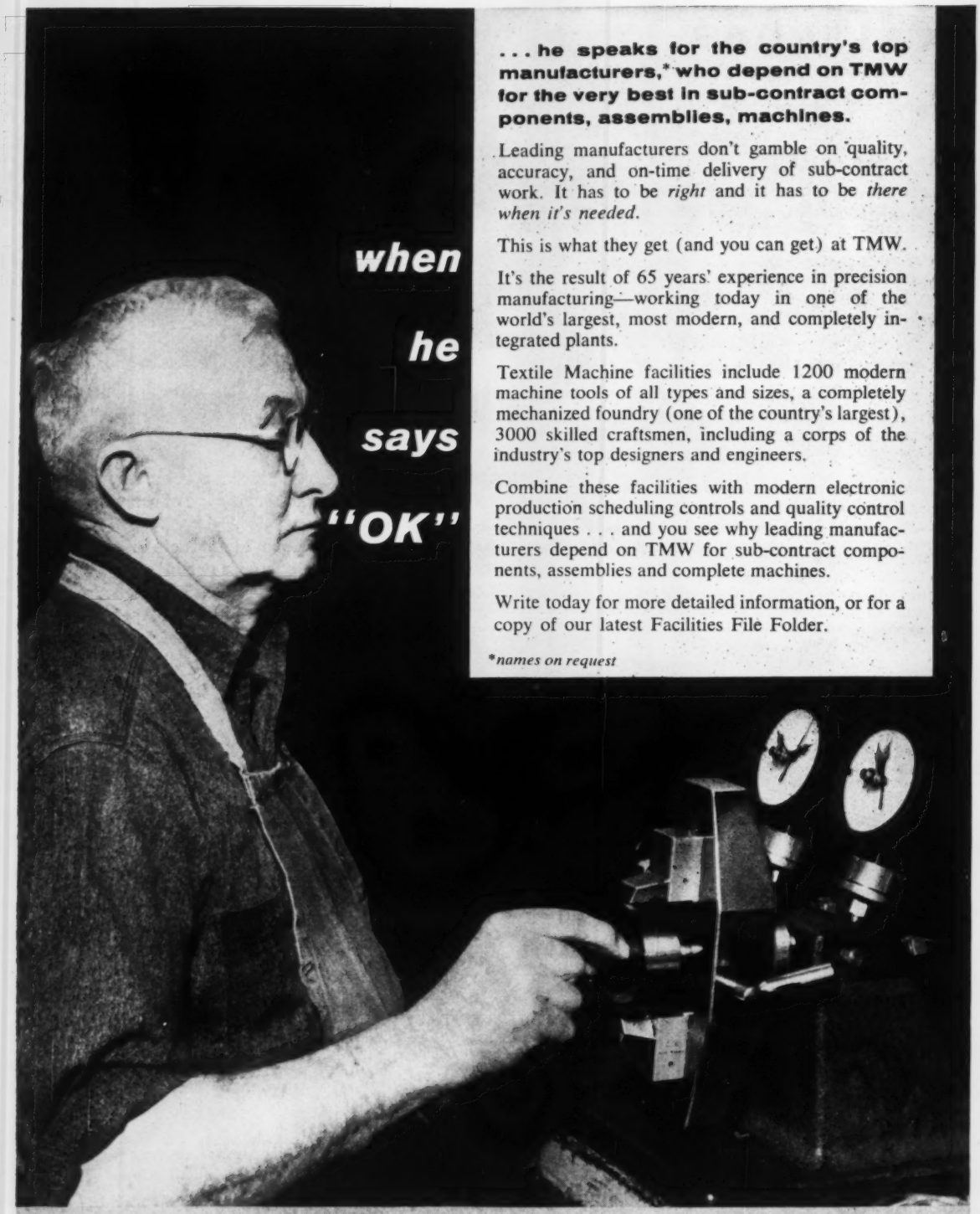
SD-1055
For Limited Clearance

440 Series
Long Lengths

SD-333
Heavy Duty

Apex also produces magnetic tools, one-piece power bits, hand drivers and other types of tools to drive Phillips screws and bolts.

APEX FASTENING TOOLS
SCREWDRIVING • NUT RUNNING • SPECIAL
The APEX Machine & Tool Co. • 1032 So. Patterson Blvd. • Dayton 2, Ohio



. . . he speaks for the country's top manufacturers,* who depend on TMW for the very best in sub-contract components, assemblies, machines.

Leading manufacturers don't gamble on quality, accuracy, and on-time delivery of sub-contract work. It has to be *right* and it has to be *there when it's needed.*

This is what they get (and you can get) at TMW.

It's the result of 65 years' experience in precision manufacturing—working today in one of the world's largest, most modern, and completely integrated plants.

Textile Machine facilities include 1200 modern machine tools of all types and sizes, a completely mechanized foundry (one of the country's largest), 3000 skilled craftsmen, including a corps of the industry's top designers and engineers.

Combine these facilities with modern electronic production scheduling controls and quality control techniques . . . and you see why leading manufacturers depend on TMW for sub-contract components, assemblies and complete machines.

Write today for more detailed information, or for a copy of our latest Facilities File Folder.

**names on request*

TEXTILE MACHINE WORKS

Contract Division • Reading, Pennsylvania

the well-guarded secret it's tough **NOT** to talk about

Many fabricators, having found Scovill Brass • Copper • Aluminum Mill Products definitely superior, try to keep their source of supply "a deep secret". This is understandable, when you consider the fact that a fabricator's best chances of licking tough competition usually lie in a LITTLE better production rate—a LITTLE better record on down-time, machine and tool maintenance—a LITTLE better quality end-product. All of these "little" improvements loom mighty BIG in the competitive picture—and all are entirely possible when you specify Brass • Copper • Aluminum mill products identified by this trademark . . .

SCOVILL *quality*
can put you ahead of competition

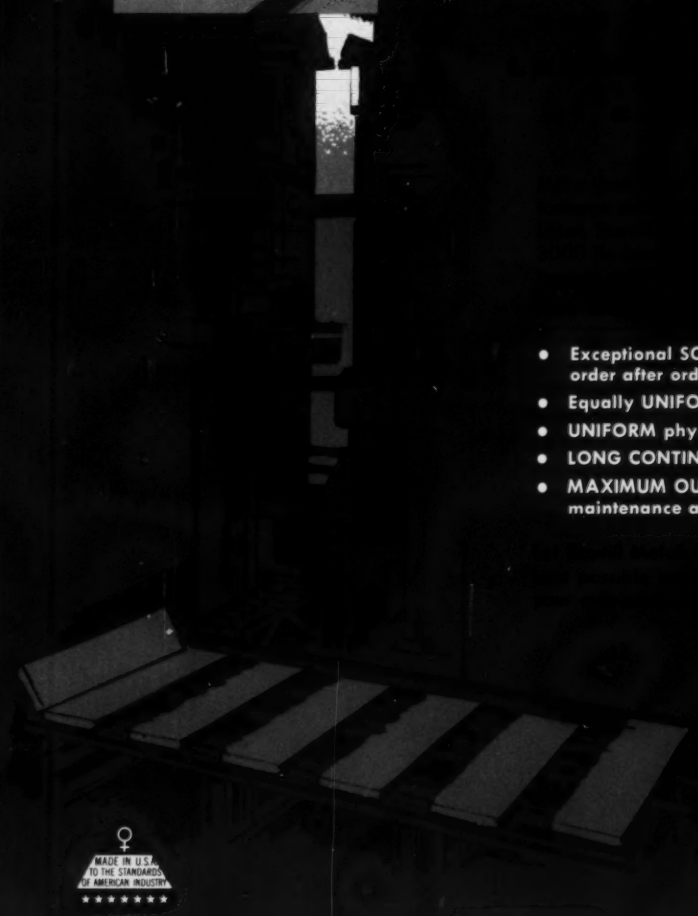
BRASS • COPPER • ALUMINUM

ISC59

Scovill Manufacturing Company, Mill Products Division, 99 Mill St., Waterbury 20, Conn. Phone PLaza 4-1171.

SCOVILL

pioneered...



- Exceptional SOUNDNESS and UNIFORMITY in the metal . . . order after order, lot after lot.
- Equally UNIFORM chemical composition of alloys.
- UNIFORM physical and mechanical characteristics.
- LONG CONTINUOUS trouble-free runs.
- MAXIMUM OUTPUT with minimum tool maintenance and adjustments.

MADE IN U.S.A. TO THE STANDARDS OF AMERICAN INDUSTRY

BEST

it PAYS to specify...

BRASS

COPPER

ALUMINUM

MILL PRODUCTS

identified by this trademark

SCOVILL ®

Scovill Manufacturing Company, Mill Products Division, 99 Mill St., Waterbury 20, Conn. Phone PLaza 4-1171.

2SC59

Stanscrew service prevents problem for manufacturer of journal bearings

The wise manufacturer eliminates any possibility of fastener breakage *before* it can become a serious and expensive field problem.

As a prime example, a leading manufacturer of sealed cartridge journal bearings was concerned about the cap screws used to hold one essential part—the thrust cap—in place. They knew the lateral movements of a railroad car resulted in thrust on this cap, imposing extremely heavy loads on these fasteners.

A call to their industrial distributor soon had a Stanscrew fastener specialist on the job. He recommended continued use of a torque wrench and worked out the proper setting so that each fastener carried its rated load. Subsequent laboratory tests proved these recommended torque settings insured against fastener breakage.

The manufacturer accepted these recommendations . . . and thus eliminated a potentially serious problem before it could develop. The torque settings and technique developed by the Stanscrew representative have been incorporated in the company's instruction and maintenance manual to insure proper maintenance procedures.

Technical assistance like this is just one of the many reasons more and more manufacturers are standardizing on Stanscrew. Trained specialists, backed by an outstanding engineering staff, can solve your particular fastener problem. In addition to assuring the dependability of your product, often they can save you money . . . for example by substituting a standard fastener for a costly "special".

Call your Stanscrew distributor today for the answers to your fastener problems. He will see that the Stanscrew Fastener Specialist visits you without delay.

STANSCREW FASTENERS

CHICAGO | THE CHICAGO SCREW COMPANY, BELLWOOD, ILLINOIS
HMS | HARTFORD MACHINE SCREW COMPANY, HARTFORD, CONNECTICUT
WESTERN | THE WESTERN AUTOMATIC MACHINE SCREW COMPANY, ELYRIA, OHIO

STANDARD SCREW COMPANY 2701 Washington Boulevard, Bellwood, Illinois

How steam treating affects ferrous and non-ferrous metals

Use of steam atmosphere is nothing new to industrial processing but the benefits to be realized from its application in the heat treating of metals have only begun to be explored in the past few years . . . and are currently attracting an increasing amount of attention.

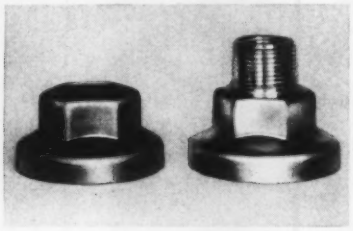
In scores of plants, working with both ferrous and non-ferrous metals, steam treating has proved an outstanding cost-cutter, according to F. L. Spangler, Application Engineer.

These trays of sewing machine parts are loaded for steam treating to give them a uniform, blue-black, wear-resistant finish. Since replacing the previously used bath method, steam treating has resulted in a 90% saving in direct labor and a reject problem has been eliminated.

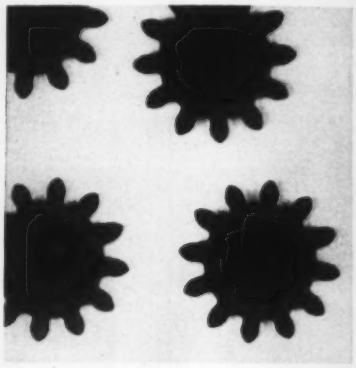
On high-speed steel cutting tools, for instance, it keeps tools sharp longer. Many drills, reamers, hobs, milling cutters, broaches, saws and similar tools hold their cutting edges 50 to 100% longer when steam treated after tempering and final grinding. This ratio goes up . . . often as high as 6 to 1 . . . when cutting such extra tough materials as alloyed structural steels.

On powdered iron parts, compressive strength and hardness increase appreciably. Tests of steam treated sintered compacts indicate that yield point under compression is twice that of a regular sintered compact.

To structural steel steam treating gives a uniform, corrosion-resistant, blue-black finish. When steam treating replaces chemical surface treatment, costs are usually 20 to 25% less . . . where it is used for stress relieving or tempering prior to machining or grinding, a shot or sand blasting operation can be eliminated.



These brass radiator steam-vent shells require nine draws and four anneals. Prior to use of a steam Homo furnace, a pickle was necessary after each anneal and a heavy pickle and buffing before final chrome plating. With steam treating the manufacturer has been able to eliminate all pickling . . . now uses only a bright dip and has substantially cut buffing time.



Powdered iron gears measuring 1⅛" in diameter were tested for hardness on a standard Rockwell machine, before and after steam treatment. After steam treating, ten parts tested showed an average increase in hardness of 43% on the gear teeth . . . 112% on gear hubs . . . and a 26% increase in compressive breaking load.

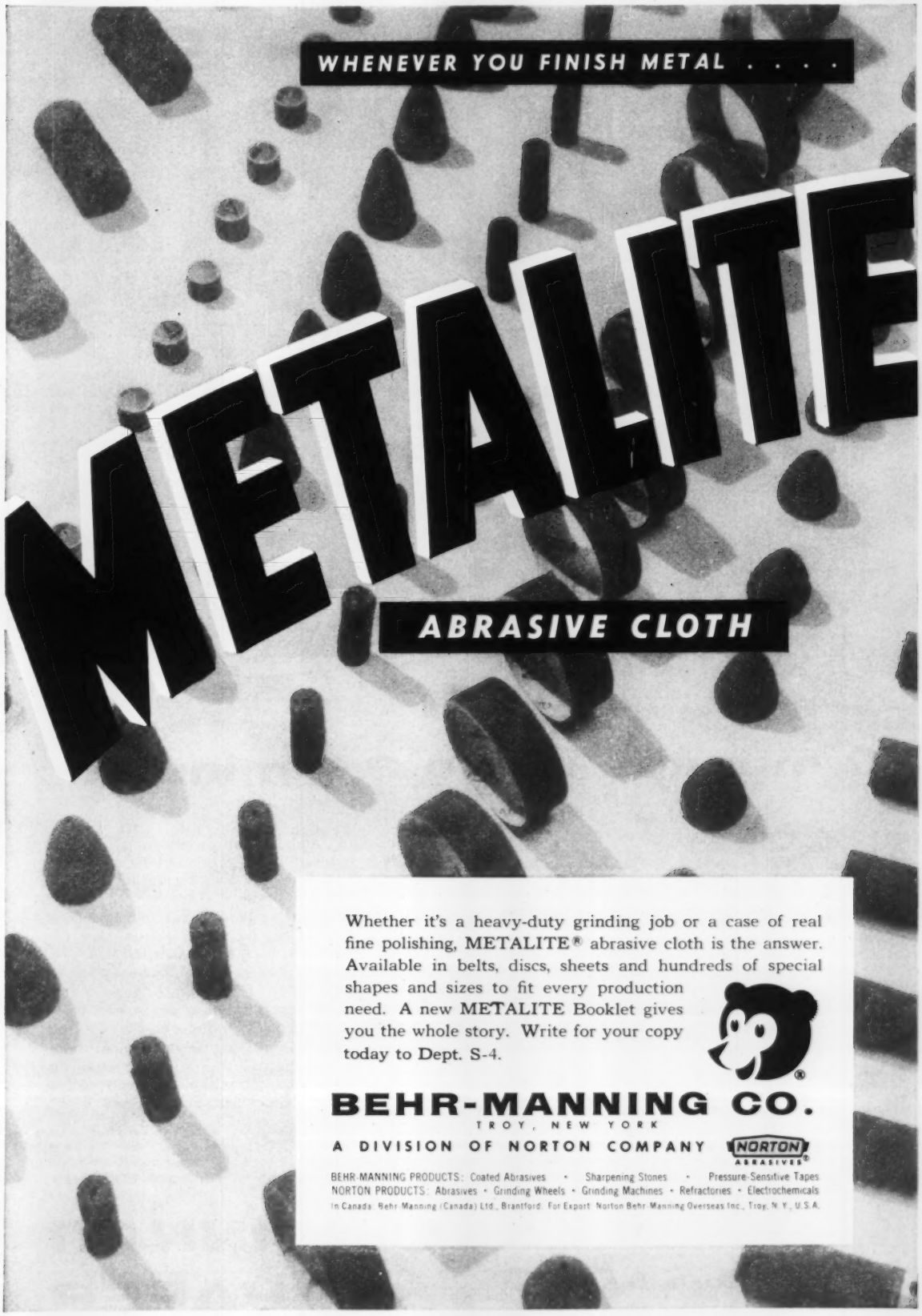
On gray iron castings steam seals microscopic porosity, improves resistance to wear and gives a high degree of corrosion resistance. Salt spray tests indicate that parts so treated stand up as well or better than cadmium plated ones.

Applied to non-ferrous metals . . . brasses, bronzes, beryllium copper, aluminum, etc. . . . it produces scale-free work ready for bright dip or use as-is. Within the past few years many manufacturers have substantially reduced and in some cases eliminated cleaning operations by stress-relieving, drawing, solution-treating or age-hardening in a steam atmosphere instead of air.

The equipment for this highly versatile heat treating method is safe and inexpensive...is ideal for installation directly in production lines.

A new 24 page catalog, *The Homo Method of Steam Atmosphere Heat Treating, gives details about application of the method to a variety of parts and materials. These specific instances may suggest ways in which this unique method can go to work for you to improve product quality . . . eliminate needless operations . . . reduce costs. Just write to Leeds and Northrup Company, 4957 Stenton Avenue, Philadelphia 44, Pennsylvania and ask for Catalog TD2-620(1).*

LEEDS Instruments **NORTHRUP** Automatic Controls • Furnaces



Whether it's a heavy-duty grinding job or a case of real fine polishing, METALITE® abrasive cloth is the answer. Available in belts, discs, sheets and hundreds of special shapes and sizes to fit every production need. A new METALITE Booklet gives you the whole story. Write for your copy today to Dept. S-4.

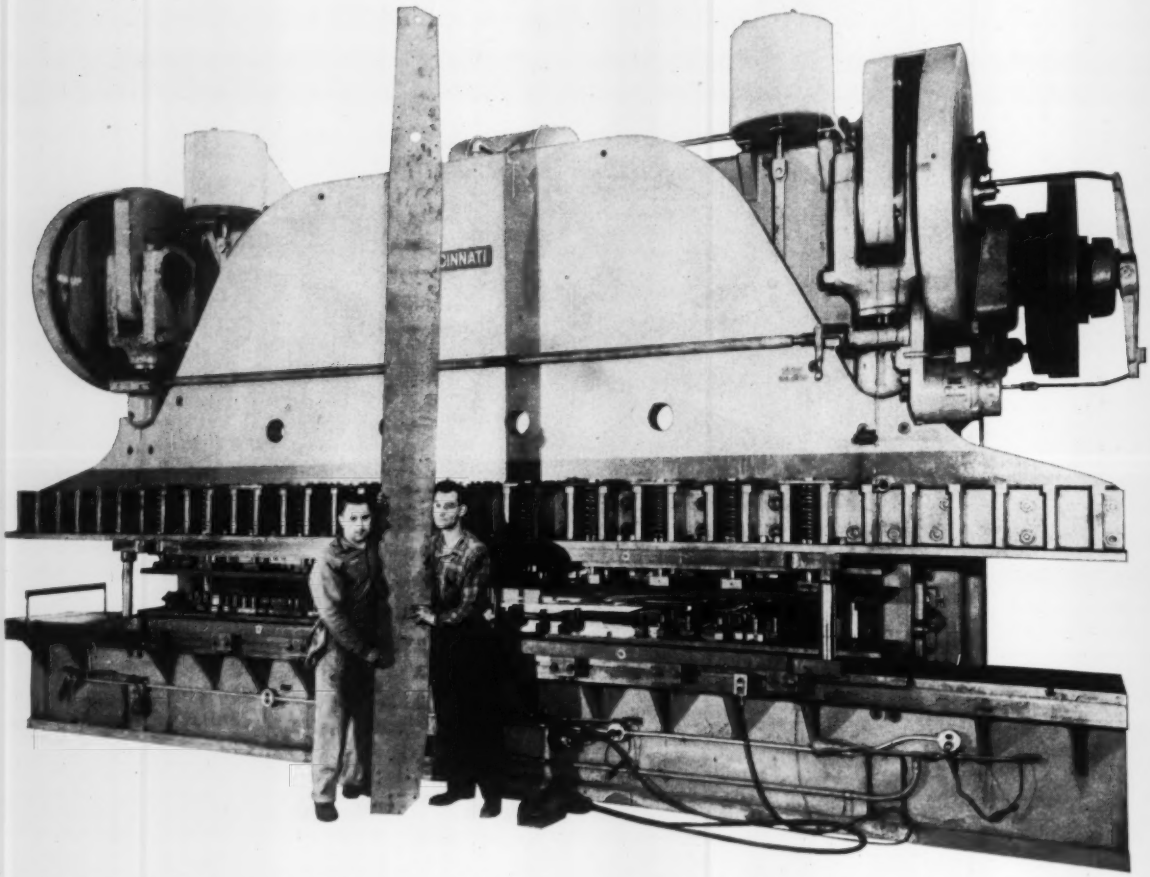
BEHR-MANNING CO.

TROY, NEW YORK

A DIVISION OF NORTON COMPANY

NORTON ABRASIVES®

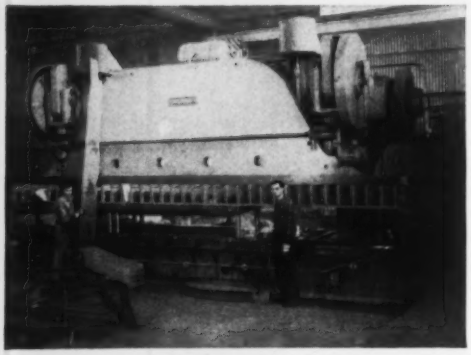
BEHR-MANNING PRODUCTS: Coated Abrasives • Sharpening Stones • Pressure-Sensitive Tapes
NORTON PRODUCTS: Abrasives • Grinding Wheels • Grinding Machines • Refractories • Electrochemicals
In Canada: Behr-Manning (Canada) Ltd., Brantford. For Export: Norton Behr-Manning Overseas Inc., Troy, N. Y., U.S.A.



Punching floor-to-floor time cut from 36 to 1-1/3 minutes.

Photos courtesy Fort Wayne Structural Steel Co., Inc.

70 minutes cut to 2.6 minutes



Blanking floor-to-floor time cut from 34 to 1¼ minutes.

In combined blanking and punching operations, production time has been reduced 96.2% on these long truck side rail reinforcements, thanks to the versatility of this Cincinnati® All-Steel Press Brake.

Operating data, furnished by John L. Hayner, President of Fort Wayne Structural Steel Co., Inc., show how his company slashed production costs so substantially.

They decreased floor-to-floor time from 34 minutes to 1¼ minutes on blanking ¼" C1010 Steel with a 202" cutting edge. By punching 130 holes per stroke, they reduced floor-to-floor time from 36 minutes to 1⅓ minutes.

Talk with our Application Engineering department about applying a time-cutting Cincinnati Press Brake in your shop. It can be the most profitable decision you've made this year. Write Department C for Press Brake catalog.

Shapers / Shears / Press Brakes

THE CINCINNATI SHAPER CO.

Cincinnati 11, Ohio, U.S.A.

...where industrial progress is cast in steel

DESIGN ENGINEERING...SERVICE IN DEPTH

Write for folder—
How General Steel Castings Can Improve Product Design and Performance.
General Steel Castings, Station 230
Granite City, Illinois

The broad scope of General Steel's design engineering department is unique in the industry. The department is well-staffed with experienced personnel skilled in design, stress analysis, testing and development work. This unified group complements the complete service offered by General Steel.

The design section alone contains many groups of specialists. In addition, you can draw upon the technical knowledge of the stress analysis group; the experimental group, with all necessary equipment and facilities to conduct static and dynamic testing; and the development group, which provides engineering services on special projects. These facilities can be of substantial benefit to you in developing cast steel structures and steel castings used in cast-weld and composite structures for your products.

Our complete services range from creative analysis of your product components in the "raw idea" stage . . . to follow-through on performance in the field. We prefer to team up with you from the start . . . for in this way you can take full advantage of our many specialized talents.

GENERAL STEEL CASTINGS

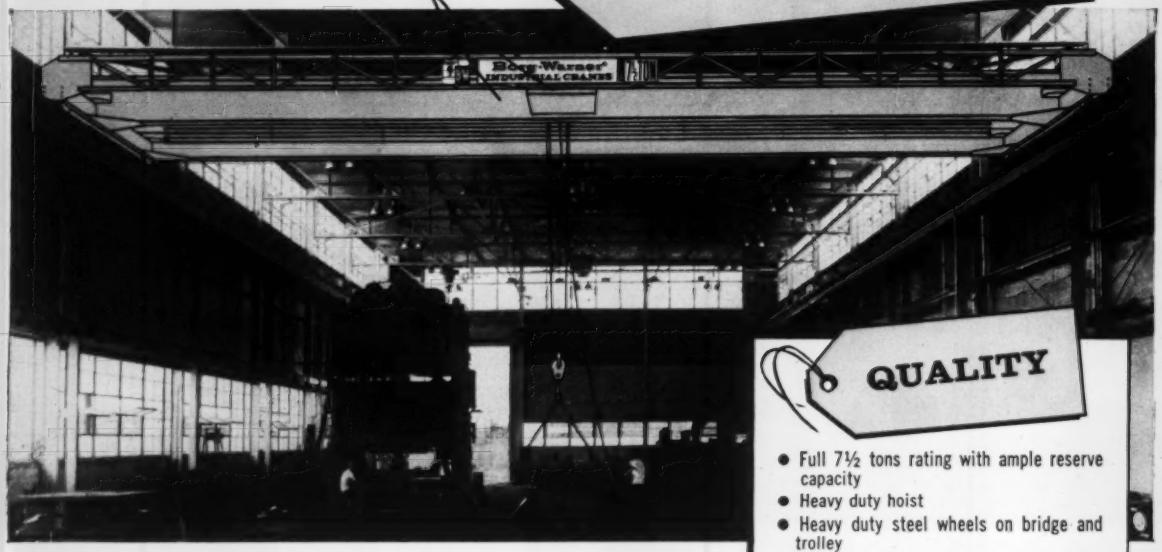
GRANITE CITY, ILL. • EDDYSTONE, PA. • AVONMORE, PA.

Borg-Warner Industrial Cranes

Quality at a price you can afford...

$9900.00

For a 7½-Ton, 60 Ft. Span, 3 Motor, Top-Running Double Girder Industrial Service Crane



Why Borg-Warner Industrial Cranes are BETTER VALUES

Value is determined by QUALITY *and* PRICE . . . and, a price like this for superior Borg-Warner Industrial Cranes construction and performance assures you of top value for your materials handling investment.

If you want to boost your production and operating profits by making full use of overhead space for materials handling . . . if you can use the extra storage space an overhead crane will provide as compared with fork-truck stacking . . . if you can benefit from aisles and work areas cleared of floor-type handling equipment . . . it will pay you to consider a Borg-Warner top-running, motor-driven crane like this. The cost may be far less than you had imagined. One crane owner thought it would cost him nearly four times this price to duplicate his crane.

Borg-Warner Industrial Cranes offers a complete line of overhead cranes . . . for light, medium or heavy service . . . constant or intermittent service at slow, medium or high speeds . . . operation from cab or floor. Get in touch with B-W Industrial Cranes today for answers to your materials handling problems.

QUALITY

- Full 7½ tons rating with ample reserve capacity
- Heavy duty hoist
- Heavy duty steel wheels on bridge and trolley
- All welded jig bored and jig assembled end trucks
- Long life precision ball and roller bearings
- Large gusset plates at end trucks
- Outrigger machinery girder construction
- Heavy duty gear reduction bridge drive
- Fluid coupled bridge and trolley drives
- Full magnetic push button control
- Magnetic bridge brake

MODERN DESIGN

The crane illustrated is a typical double girder installation. For shorter spans, smaller capacities and lighter or intermittent duty Borg-Warner Industrial Cranes can supply your needs at even lower prices.

Industrial CRANES

INGERSOLL PRODUCTS

B-W

BORG-WARNER

Design it better . . .
Make it better.

Find Your Nearest Distributor Under CRANES in The Yellow Pages

Distributors in all principal industrial cities.

Borg-Warner® INDUSTRIAL CRANES

1550 S. PAULINA STREET, CHICAGO 8, ILLINOIS

Export Sales: Borg-Warner International, 36 South Wabash Ave., Chicago 3, Illinois

Type 304 stainless plate, dimensions: 6⅝" thick x 75" diameter. Weight, 8655 lbs.

take a look

...at the clean edges of this stainless plate accurately cut by Carlson

THIS stainless plate illustrates something that's almost a Carlson exclusive. Few producers can make plates of such heavy gauge, and fewer still have the long experience in flame cutting stainless to precise dimensions. To develop the proper equipment, the exact gas and iron powder formula, and the special nozzles, took Carlson engineers years of effort. But the result was worth it.

The edges achieved by these improvements reduce the cost of subsequent machining operations. And every Carlson stainless plate—whether heavy or light gauge—carries its own identification. Its chemical and physical properties are known and recorded. Its dependable performance on the job is assured.

The complete reliability of every Carlson service will materially reduce your ultimate costs. Our specialists make certain that your instructions are followed in every detail. Write, wire or phone for further information on all our services in stainless steel.

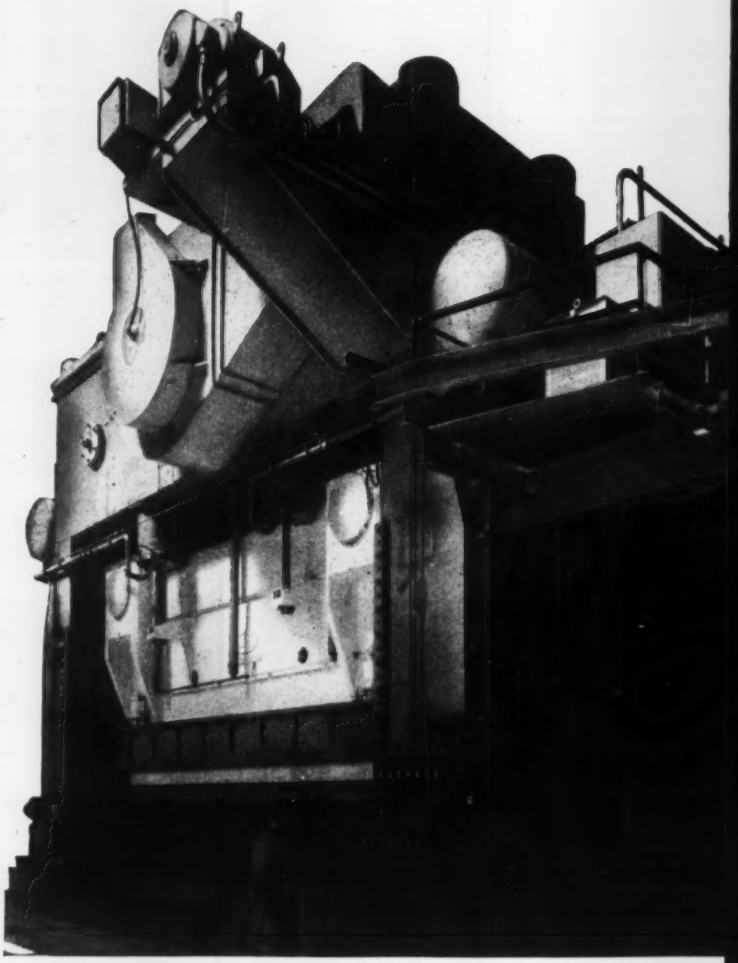
G.O.CARLSON Inc.

Stainless Steels Exclusively

122 Marshalton Road
THORNDALE, PENNSYLVANIA
District Sales Offices in Principal Cities

PLATES • PLATE PRODUCTS • HEADS • RINGS • CIRCLES • FLANGES • FORGINGS • BARS AND SHEETS (No. 1 Finish)

Deflection .0013″ Per Foot—Parallelism .00025″ Per Foo Over 40 Feet in this Giant 4000-Ton Press Produced by DANLY for A. O. Smith Corporation



Side members for truck frames are stamped out in sizes up to 40 feet in length for the heaviest duty trucks in this 4,000-ton Danly press at the Milwaukee Plant of the A. O. Smith Corporation. The press slide comes down once and a heavy-gauge steel "sidebar" is ready for assembly. The press operating rate is 10 strokes per minute.

The bed deflection .0013″ per foot—measured and tested by A. O. Smith engineers—required a bed so massive that it had to be made in two halves along the right to left center line, to stay within transportation limits. The halves are tie-rodded and keyed together.

The cushions, placed in the bed opening, are so constructed that they will absorb any extremes of off-center loading.

The bed surface and slide each machined at one setting—checked out flat and parallel within .009″ over the 40 ft. length representing a parallelism bed to slide .00025″ per foot.

The Danly Microinching Drive will move the slide through an entire cycle at slow speed for die setting and produce an accurate part without stopping the flywheel and deliver full-rated capacity of the press.

The extremes of weight, size and accuracy of welded-steel fabrication and machining represented in this press were achieved by the combination of heavy handling equipment including 100-ton Whiting Cranes and the 7″ Giddings & Lewis Horizontal Bars mounted on 100 ft. runways in Danly's new facilities.

The press is now operating. It is reflecting the accuracy of manufacture to its great size by stamping accurate parts in daily production.

This press was designed specifically for, and in cooperation with, A. O. Smith Corporation, pioneers in efficient production and leading supplier to the automotive industry . . . by Danly, the leading supplier of stamping equipment to the automotive industry.

This press typifies Danly's ability to work with you to design, engineer, and produce new presses for new applications to increase capacity, lower stamping costs, lengthen die life, and reduce downtime. Find out how.

WRITE FOR CATALOGS that interest you on:
Danly O. B. I. Presses • Straight Side Presses
Autofeed Presses • Double-Action Straight Side Presses
Underdrive Presses • Quick Die Change Presses
. . . as well as accessories and controls

DANLY 4000 TON STRAIGHT SIDE PRESS

Tonnage	4000 at 1/2″ up; 2500 at 5″ up		
Bed size	480″ x 60″	Stroke	22″
Slide	480″ x 42″	Strokes per minute	10
Shutheight	48″	Points of connection	4

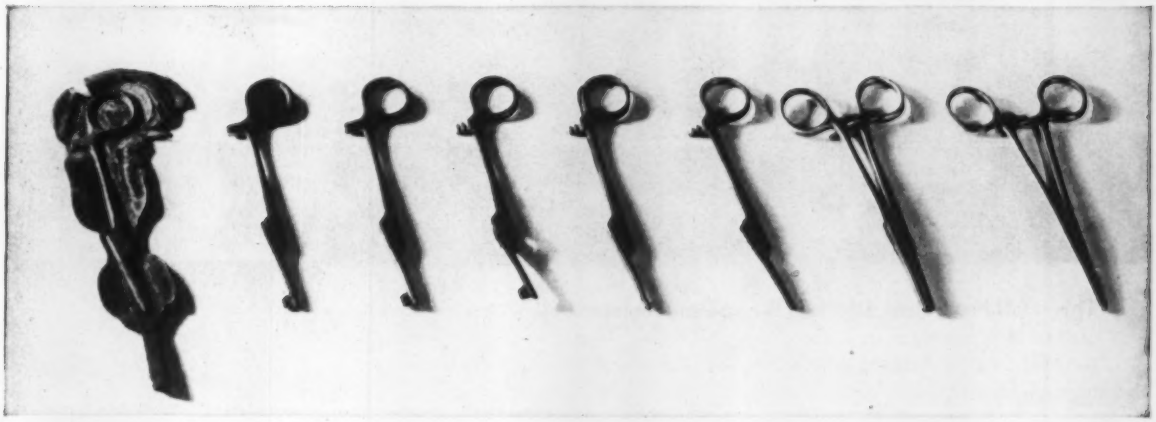
The Leading Supplier to the Stamping Industry

DANLY MACHINE SPECIALTIES, INC. DANLY 2100 S. Laramie Ave. • Chicago 50, Illino

MECHANICAL PRESSES • DIE SETS • DIE MAKERS' SUPPLIES

for strength, corrosion resistance and high finish

...it had to be Stainless

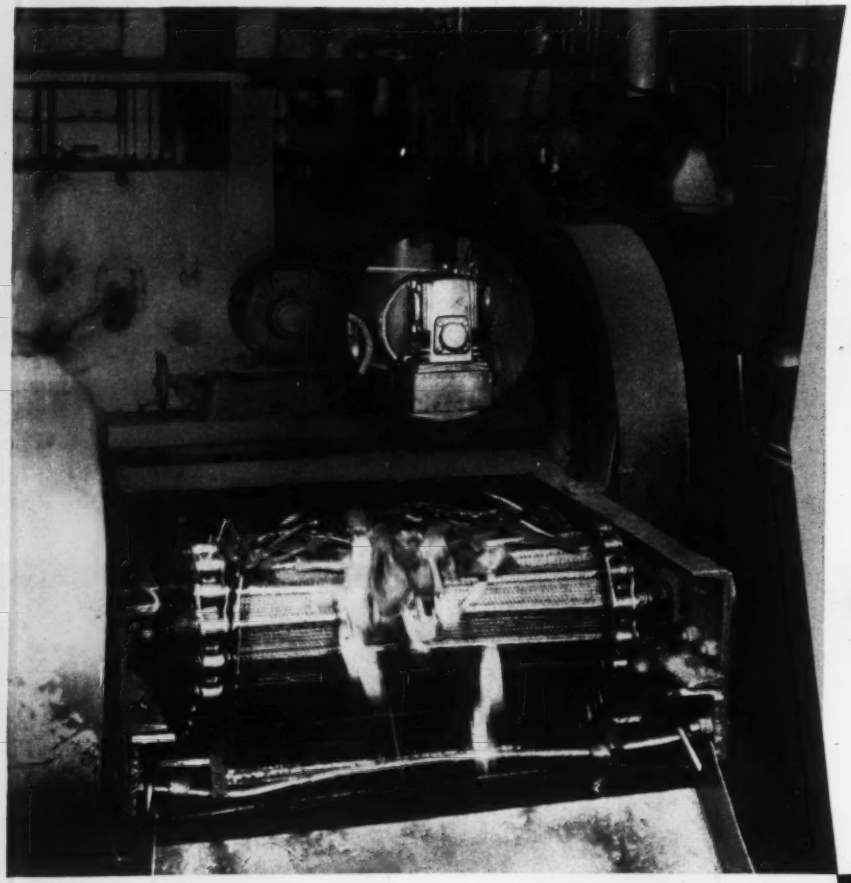


All orders for stainless steel for these artery forceps specify "Carpenter" because of "uniformity from shipment to shipment". Freedom from seams and excellent machining to close tolerances are other reasons given by the fabricator. The stainless is specially processed to meet the rigid specifications. By specifying Carpenter you can take the pressure off both designer and fabricator. High temperatures and stress variations are no longer problems. We'll back up our success stories with technical data and on-the-job service. Call your Carpenter representative for information on the stainless you need. The Carpenter Steel Company, 139 W. Bern Street, Reading, Pa.

Carpenter STEEL

The Carpenter Steel Company
Main Office and Mills, Reading, Pa.
Alloy Tube Division, Union, N. J.
Webb Wire Division, New Brunswick, N. J.
Carpenter Steel of New England, Inc., Bridgeport, Conn.

Foote Bros. Drives in the METALWORKING INDUSTRY



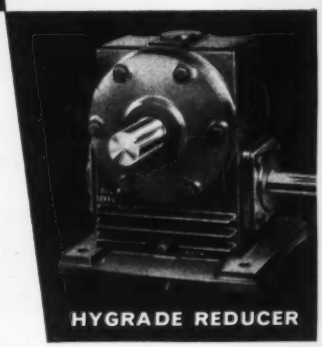
Hot Stuff Coming Up On Schedule

This small Foote Bros. Hygrade Worm Gear Reducer is driving a quench tank conveyor in a large midwest heat treating plant. Parts from the heat treating furnace drop on the wire mesh belt, which moves them through an oil quench tank on a precisely determined time schedule.

To provide the proper quench and insure on-time delivery of parts to the customer, the operation of this conveyor is of critical importance. Though it was installed almost two years ago, the Hygrade Reducer has operated perfectly under tough working conditions.

You can see Foote Bros. Hygrade Worm Gear Reducers in capacities ranging from 168 HP down to ⅓ HP, doing almost every kind of power transmission job in metalworking plants—from driving giant machines to powering small conveyors like the one shown here. The reason? Metalworking men *know* they can depend on Hygrade Reducers for the rugged stamina and reliability that has made them the buy-word in the industry.

There's a Foote Bros. unit available to meet your drive requirements. Your Authorized Foote Bros. Distributor is as close as your telephone. Ask him to recommend the right unit for your requirements. Find his name in your Classified Telephone Directory.



HYGRADE REDUCER

Hygrade Reducers of this type are stocked by your Authorized Foote Bros. Distributor. Ask him for STOCK PRODUCTS CATALOG SPA, which describes the complete line.

100 YEARS SERVING INDUSTRY 1859-1959

FOOTE BROS.

Better Power Transmission Through Better Gears

FOOTE BROS. GEAR AND MACHINE CORPORATION • 4583 SOUTH WESTERN BOULEVARD • CHICAGO 9, ILLINOIS

1. FABRICATION of all types of equipment (Fractionating Columns, Gas Columns, Pressure Vessels, Plate and Heavy Steel Work, Special Machines, Autoclaves, Shells, Bridge Girders) is performed to order, to specification.

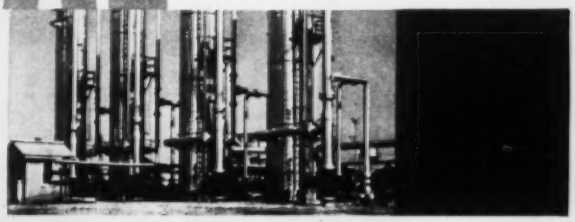
2. MACHINING—Fully equipped, flexible facilities for machining to close tolerances, regardless of product size or design.

3. STAINLESS—Separate, integrated shop for stainless fabrication protects against contamination by ordinary steel.

4. DELIVERY by rail, truck or inland, coastal or overseas waterway.

POTENTIAL

1 FABRICATION



2 MACHINING

3 STAINLESS

4 DELIVERY

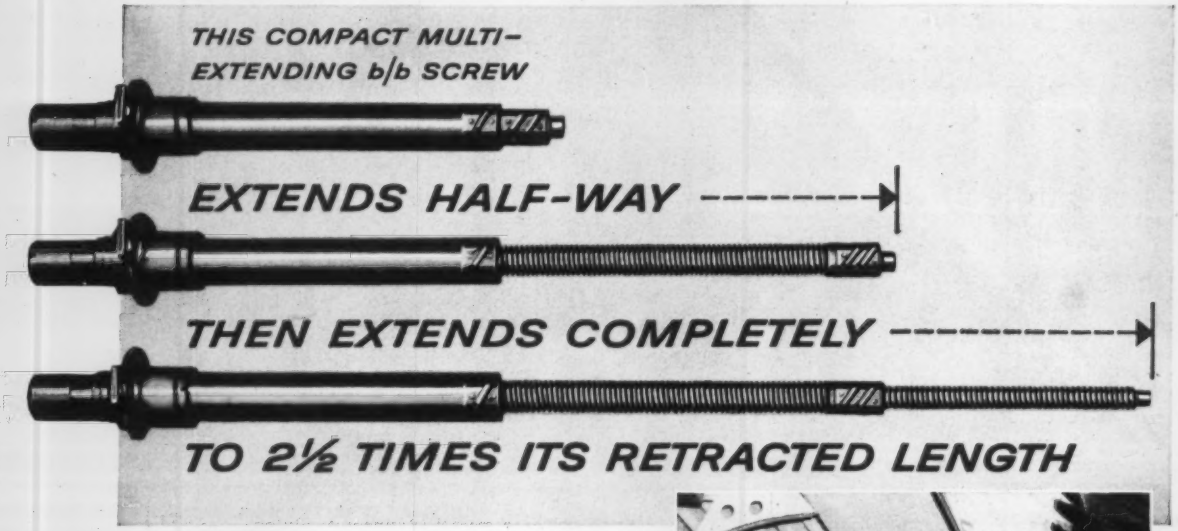
Through integrated, efficient operation, Sun Ship can reduce costs, increase your POTENTIAL. Call for an estimator or representative.

Sun

SHIPBUILDING & DRY DOCK COMPANY

ON THE DELAWARE • SINCE 1916 • CHESTER, PA.

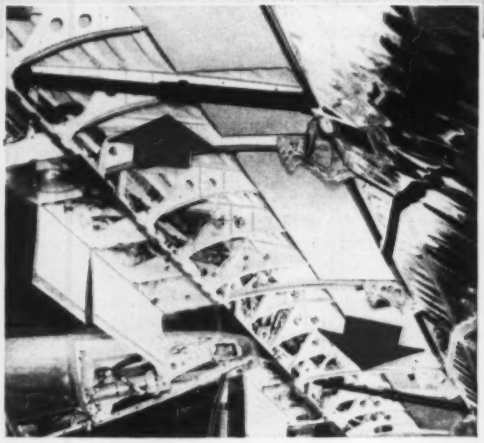
FAR-REACHING EXTENSION FROM LIMITED ACTUATOR SPACE



Now Saginaw supplies the answer to your most difficult actuator space problems with the Multi-Extending Saginaw Screw! Utilizing Saginaw's time-proved *recirculating ball* principle in multiple telescoping sections, the Multi-Extending b/b Screw conquers actuator space obstacles designers have been seeking to overcome for years! Here's why:

1. **UNIT EXTENDS** in a ratio of 2.5 to 1, providing maximum extension 2½ times the length of the retracted screw.
2. **FAR GREATER LOAD CAPACITY** than any other telescoping device in its class.
3. **FAR MORE PRACTICAL AND TROUBLE-FREE** than other telescoping units on the market.
4. **PRECISE, DEPENDABLE POSITIONING** and control within thousandths of an inch.

• OVER 90% EFFICIENCY • REQUIRES UP TO 4/5 LESS TORQUE than acme screws • LESS DRAIN on power supply • CONSERVES SPACE AND WEIGHT • OPERATES DEPENDABLY at extreme temperatures • PERFECT FUNCTIONING with only initial lubrication



USED ON THE COUNTRY'S MOST MODERN AIRCRAFT—Multi-Extending b/b Screw wing flap actuators being installed on the new Lockheed Electra.

The Saginaw Multi-Extending Screw is also used to actuate speed brakes, afterburners, variable air inlets, canopies and similar critical components on today's newest aircraft.

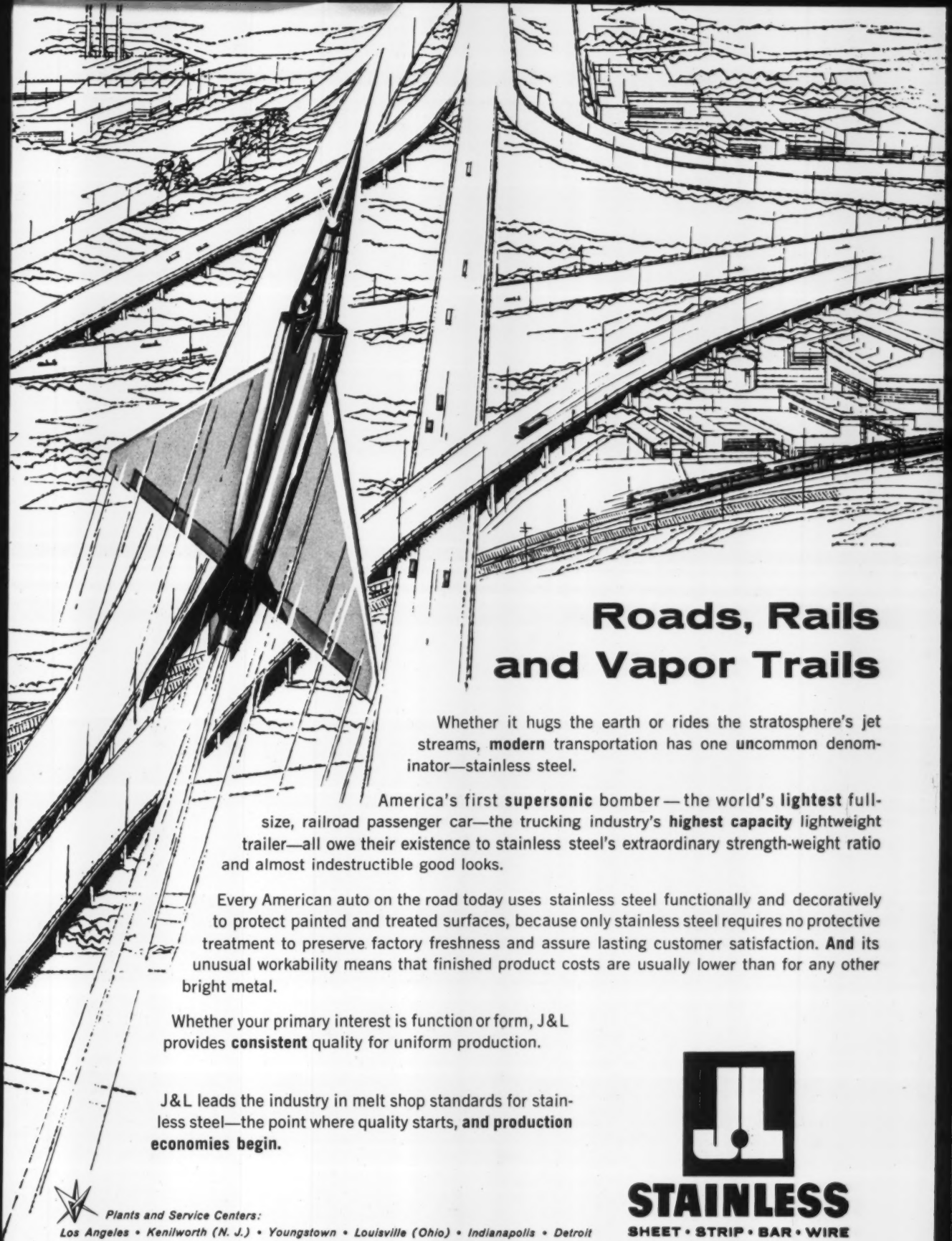
Send today for the new 1959 engineering data book on Saginaw b/b Screws and Splines... or see our section in Sweet's Product Design File.

Saginaw

WORLD'S MOST EFFICIENT ACTUATION DEVICE

ball bearing Screw

SAGINAW STEERING GEAR DIVISION, GENERAL MOTORS CORPORATION • SAGINAW, MICHIGAN



Roads, Rails and Vapor Trails

Whether it hugs the earth or rides the stratosphere's jet streams, **modern** transportation has one **un**common denominator—stainless steel.

America's first **supersonic** bomber—the world's **lightest** full-size, railroad passenger car—the trucking industry's **highest capacity** lightweight trailer—all owe their existence to stainless steel's extraordinary strength-weight ratio and almost indestructible good looks.

Every American auto on the road today uses stainless steel functionally and decoratively to protect painted and treated surfaces, because only stainless steel requires no protective treatment to preserve factory freshness and assure lasting customer satisfaction. **And** its unusual workability means that finished product costs are usually lower than for any other bright metal.

Whether your primary interest is function or form, J&L provides **consistent** quality for uniform production.

J&L leads the industry in melt shop standards for stainless steel—the point where quality starts, **and production economies begin.**

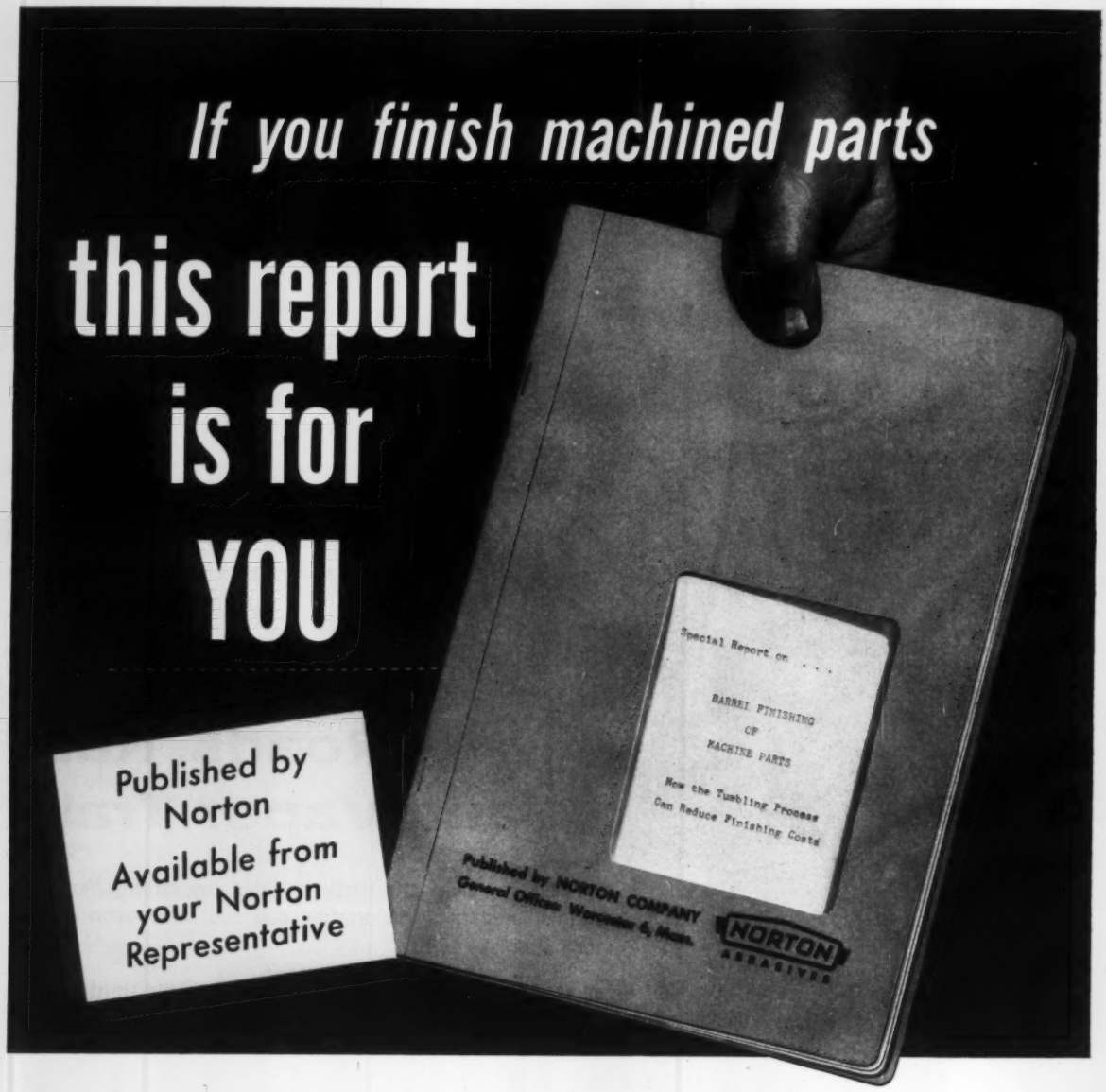
Plants and Service Centers:
Los Angeles • Kenilworth (N. J.) • Youngstown • Louisville (Ohio) • Indianapolis • Detroit

J&L
STAINLESS
SHEET • STRIP • BAR • WIRE

Jones & Laughlin Steel Corporation • STAINLESS and STRIP DIVISION • Box 4606, Detroit 34

If you finish machined parts

this report is for YOU



Published by Norton

Available from your Norton Representative

Barrel-Finishing Machined Parts, one of a Norton series of reports, is based on the outstanding advantages of barrel-finishing over hand-finishing for many jobs.

Written by Norton Abrasive Engineers, who serve all industry, it tells you how barrel-tumbling improves surface finish and fatigue strength, removes burrs, forms uniform radii and reduces the production costs of all types of machined parts. And it describes how many users have found TUMBLEX* abrasives ideal for these applications. For example:

Manual finishing of large fabricated aircraft gears with a 4" wide tooth took eight hours each and left the tooth ends rough. With barrel-finishing, using random shaped ALUNDUM* TUMBLEX *"A" abrasive in combination with* TUMBLEX *"T" triangles, the gears could be tumbled in pairs producing uniform radii and a uniform, refined surface on the entire tooth.*

Deburring of a tube 2" long, ½" I.D., externally threaded, would normally require triangular tumbling abrasive, which would eliminate wedging. But since the I.D.'s also required smoothing, we found ALUNDUM TUMBLEX *"S" spheres rolled freely in and out, without wedging or damage to threads.*

Get this report from your Norton Representative. It's as near as your phone. He'll also gladly supply facts and literature on all TUMBLEX Types: "A" (random shaped chips), "T" (bonded triangles), "S" (bonded spheres), and "N" (natural stones), covering all finishing requirements, on the widest range of materials. And for better, lower cost finishing of your work parts, send samples to our Sample Processing Department. They'll be finished and returned to you promptly, with complete facts as to abrasives, methods and equipment. NORTON COMPANY, General Offices, Worcester 6, Mass. Plants and distributors around the world.

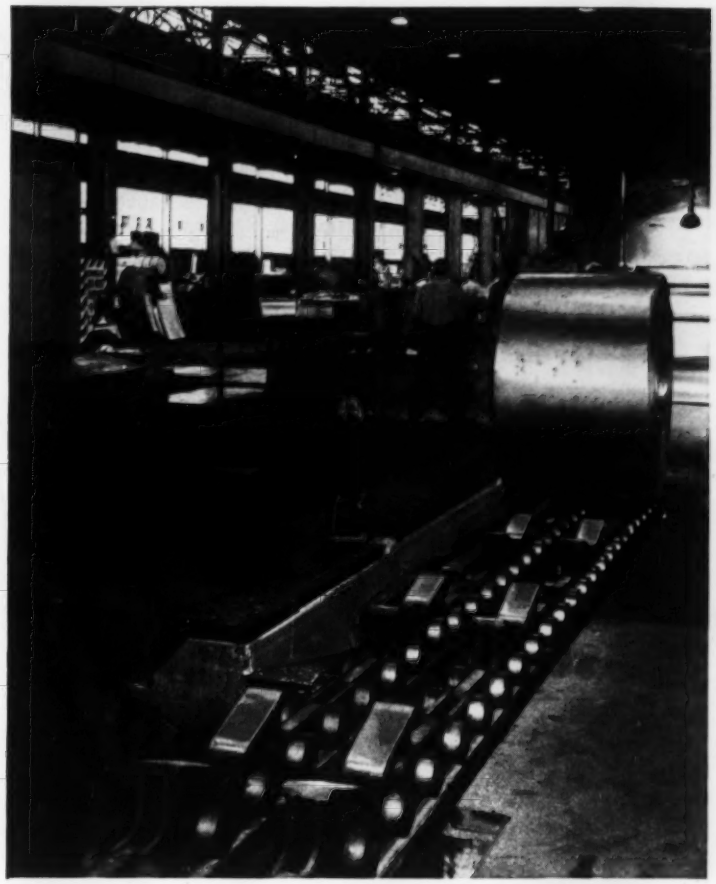
*Trade-Marks Reg. U.S. Pat. Off. and Foreign Countries

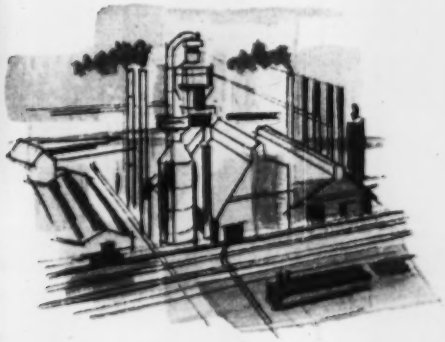
G-363

NORTON ABRASIVES

Making better products . . . to make your products better

NORTON PRODUCTS Abrasives • Grinding Wheels • Grinding Machines • Refractories • Electrochemicals — **BEHR-MANNING DIVISION** Coated Abrasives • Sharpening Stones • Pressure-Sensitive Tapes





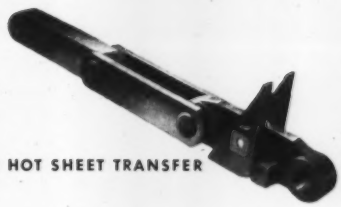
get steel mill toughness

in Jeffrey chains

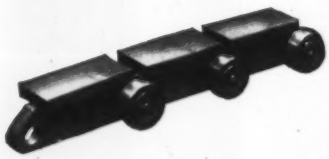
Starting right with selection of metals to give maximum strength with minimum weight, Jeffrey builds durability into steel mill chains. They are designed for continuous operation. Machining, heat treatment, assembly and inspection are rigidly controlled to Jeffrey's high standards.

You can select Jeffrey chain and attachments for every steel mill requirement or have them tailor-made to fit the job. The Jeffrey Manufacturing Company, 889 North Fourth Street, Columbus 16, Ohio.

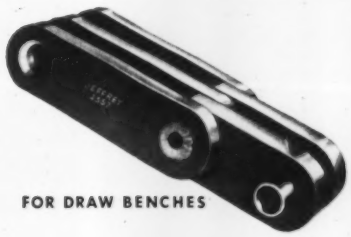
FOR CROP CONVEYORS



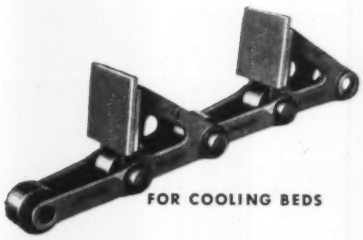
FOR HOT SHEET TRANSFER



FOR HOT COIL CONVEYORS



FOR DRAW BENCHES



FOR COOLING BEDS

FOR PALLET CONVEYORS

JEFFREY

CONVEYING • PROCESSING • MINING EQUIPMENT...TRANSMISSION MACHINERY...CONTRACT MANUFACTURING

JAKE'S MORE INTERESTED IN MAKIN' THEM SINKERS THAN TAPPIN' THAT SPECIAL HEAT!
ONE MORE TURN OF SINKERS AND HIS LOCKER WILL GO THROUGH THE FLOOR.
BY NOW HE SHOULD HAVE ENOUGH TO LAST HIM AND ALL HIS RELATIVES THE NEXT 200 YEARS.
FIELD & STREAM
SINKERS
SINKERS
THANKS TO:
OPEN HEARTH CREWS, NO 2 & 3 SHOPS
LUKENS STEEL COMPANY
COATESVILLE, PA.
KUEKES

The Fisherman

WHY NOT DESCRIBE YOUR OPEN-HEARTH CARTOON IDEA AND SEND IT ALONG TO US?

The benefits steelmakers obtain from our refractories are in part a result of Basic's on-the-job servicing. One of the rewards of this close relationship has been the opportunity to observe and appreciate the lighter side of these usually serious craftsmen.

Magnefer and Syndolag Set Fast—Stay Fast

BASIC INCORPORATED 845 HANNA BUILDING • CLEVELAND 15, OHIO

Needed: New Kind of Union Leader for '60s

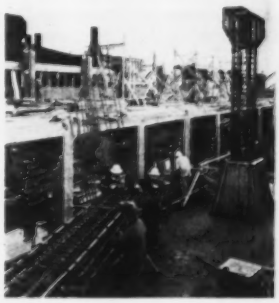
Thoughtful labor officials see leadership as their central problem in the decade ahead (Page 51). America's industrial unions got their big start in the mid-1930s. They're reaching maturity now—some perhaps even have the middle age spread. The reflective leaders can look to Europe with its older labor movement to see the advantages of maturity, the disadvantages of paunch. The problems: Poor climate for bright young men in labor; uncertainties about how to organize the rapidly growing whitecollar group of workers.

Recession: SUB Fund Acid Test

Administrators of Supplemental Unemployment Benefit funds learned some valuable lessons from the recession's drain on accounts: Benefit funds are actuarially strong, although they require a rather lengthy buildup period. Auto funds, started 14 months before steel funds, are still at par or better despite a long unemployment trend. Steel company funds weren't sizable enough to match all needs when the recession came because of the late start. Steelworker benefit agreements so far have paid out about $64 million; another $20 million will be released from escrow for Ohio workers when SUB becomes law there.

Reinforcing Steel Hits Fast Clip

The seasonal construction surge and strike hedge buying are making sales of reinforcing bars better than they have been in months. Both domestic and imported bars are responding to a brisk demand in the heavy construction industry. Contracts are up sharply from where they were a year ago; in the first 13 weeks of this year heavy construction awards totaled $4.6 billion and are now running at $355.4 million weekly (Page 141).



Atlantic Steel Sues Tariff Commission

Atlantic Steel Co. originally requested the Tariff Commission to investigate the harm steel imports are doing to domestic fencing, wire, and nails. Now, Atlantic has sued to try to force the commission to investigate barbed wire. The commission had refused to open an inquiry on that product on the ground that it was placed on the free import list by Congress under special circumstances. Farmers traditionally import wire free. The commission feels

JAKE'S MORE INTERESTED IN MAKIN' THEM SINKERS THAN TAPPIN' THAT SPECIAL HEAT!
ONE MORE TURN OF SINKERS AND HIS LOCKER WILL GO THROUGH THE FLOOR.
BY NOW HE SHOULD HAVE ENOUGH TO LAST HIM AND ALL HIS RELATIVES THE NEXT 200 YEARS.
FIELD & STREAM
SINKERS
SINKERS
SINKERS
THANKS TO:
OPEN HEARTH CREWS, NO. 2 & 3 SHOPS
LUKENS STEEL COMPANY
COATESVILLE, PA.
KUEKES

The Fisherman

WHY NOT DESCRIBE YOUR OPEN-HEARTH CARTOON IDEA AND SEND IT ALONG TO US?

The benefits steelmakers obtain from our refractories are in part a result of Basic's on-the-job servicing. One of the rewards of this close relationship has been the opportunity to observe and appreciate the lighter side of these usually serious craftsmen.

Magnefer and Syndolag Set Fast—Stay Fast

BASIC INCORPORATED 845 HANNA BUILDING • CLEVELAND 15, OHIO

Metalworking Outlook

April 13, 1959

Needed: New Kind of Union Leader for '60s

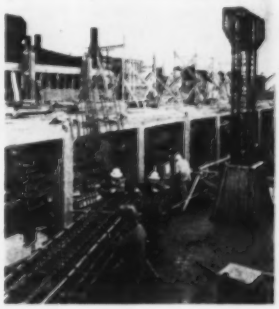
Thoughtful labor officials see leadership as their central problem in the decade ahead (Page 51). America's industrial unions got their big start in the mid-1930s. They're reaching maturity now—some perhaps even have the middle age spread. The reflective leaders can look to Europe with its older labor movement to see the advantages of maturity, the disadvantages of paunch. The problems: Poor climate for bright young men in labor; uncertainties about how to organize the rapidly growing whitecollar group of workers.

Recession: SUB Fund Acid Test

Administrators of Supplemental Unemployment Benefit funds learned some valuable lessons from the recession's drain on accounts: Benefit funds are actuarially strong, although they require a rather lengthy buildup period. Auto funds, started 14 months before steel funds, are still at par or better despite a long unemployment trend. Steel company funds weren't sizable enough to match all needs when the recession came because of the late start. Steelworker benefit agreements so far have paid out about $64 million; another $20 million will be released from escrow for Ohio workers when SUB becomes law there.

Reinforcing Steel Hits Fast Clip

The seasonal construction surge and strike hedge buying are making sales of reinforcing bars better than they have been in months. Both domestic and imported bars are responding to a brisk demand in the heavy construction industry. Contracts are up sharply from where they were a year ago; in the first 13 weeks of this year heavy construction awards totaled $4.6 billion and are now running at $355.4 million weekly (Page 141).



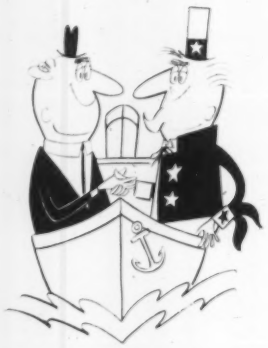
Atlantic Steel Sues Tariff Commission

Atlantic Steel Co. originally requested the Tariff Commission to investigate the harm steel imports are doing to domestic fencing, wire, and nails. Now, Atlantic has sued to try to force the commission to investigate barbed wire. The commission had refused to open an inquiry on that product on the ground that it was placed on the free import list by Congress under special circumstances. Farmers traditionally import wire free. The commission feels

Technical Outlook—Page 105 Market Outlook—Page 139

that Congress should act to change the tradition, rather than having the matter handled under the escape clause.

U. S. to Ease Foreign Plant Taxes



If you're planning to buy or build a foreign subsidiary, you'll be happy to hear that Capitol Hill is developing plans to give overseas plants a real tax advantage. A State Department report recommends deferring income taxes on profits of a foreign business corporation until they are distributed to U. S. owners, or otherwise diverted from foreign uses. The administration and Congress are reported to like the idea (Page 62).

Forecasts Continued Unemployment

The Department of Labor has advised Congress that unemployment will continue high for the next year, reports the AFL-CIO. Citing growth of the labor force and rising output per worker, the department predicted that even with more recovery, the fiscal year starting on July 1 will see an average of 2.1 million persons drawing jobless benefits each month while 2 million more will exhaust state jobless benefits. The union says the outlook was given in closed door testimony before the House Ways & Means Committee just before the House approved extension of temporary unemployment compensation.

Second Producer of Prime Magnesium Enters Field

Alabama Metallurgical Corp. will start to make prime magnesium this fall. The young affiliate of Brooks & Perkins and Calumet & Hecla will be Dow Chemical Co.'s first commercial competitor in prime magnesium. Alabama Met's initial capacity will be 6800 tons annually; Dow's yearly capacity is 83,000 tons. Metalmen look for a price cut in time as increased availability and competition open up new markets. Dow says it welcomes the competition (Page 53).

IUE Charges GE with 'Desertion'

The electrical workers union struck out at General Electric Co.'s plant closing in the East with a television movie depicting the plight of jobless workers, victims of "decentralization." The next day GE replied in newspaper ads that its Bloomfield, N. J., works finally went out of business after years of decline; it pointed out that the firm's $1.5 billion outlays for plant and equipment since the war had gone (for the most part) into older facilities in the North and East.

Aluminum-Magnesium Alloys at Work

Weldability and strength are two properties of the aluminum-magnesium alloys which are attracting attention in structural fields. The alloys have been put to work in mammoth dump trucks and aircraft carriers. Chemical firms like them for building their biggest storage tanks; one alloy aids in hauling uranium ore. Unprotected alloys exhibit superior corrosion resistance even in Venezuelan oil country (Page 106).

Reuther, McDonald Getting Chummy?

A warming relationship is developing between UAW chief Walter Reuther and the head of the steelworkers' union, David McDonald. The rapprochement developed because they shared similar views during AFL-CIO bickering in Puerto Rico; it may be cemented by UAW financial aid to the steelworkers in case of a strike this summer. Significance: The two unions have been trying to outdo each other in getting contract gains. That rivalry may diminish.

Putting the Heat on Alloy X

If you're doing high temperature brazing, you might take a look at furnace trays, racks, baskets, and retorts that can take temperatures up to 2300° F. The retorts are made of Hastelloy alloy X by Haynes Stellite Co., Kokomo, Ind., a division of Union Carbide Corp. They last twice as long as retorts made of another high nickel alloy. One, 18 in. in diameter, saves the company $1000 every 100 days it's operated. Thinner sheets are used, cutting material cost, shortening cycles, and reducing fuel bills (Page 110).

U. S. Studies Airborne Freighter

Uncle Sam is studying the development of an air freighter that could compete with surface carriers, says E. R. Quesada, Federal Aviation Agency administrator. The design would be exclusively for military and civilian cargo. The government is merely promoting this "untapped opportunity in air freight," says Mr. Quesada. It's not assuming the research functions of aircraft companies.

Predicts Doubled Missile Spending

Missile production spending will double in five years and create a lot of subcontract work, predicts Kendall K. Hoyt, director of the Association of

Missile & Rocket Industries, Washington. He says that since about half the money spent for missilework has gone into highly specialized research and development, the big climb in production spending is ahead. Mr. Hoyt reports that more than 2000 companies are identified with missilework, not counting unidentified suppliers.

Metalworking Directories on the Way

You soon will be able to take the guesswork out of establishing customer and market potentials with Dun & Bradstreet Inc.'s national and regional directories of metalworking markets. The comprehensive books, to be published in November, will list 30,000 metalworking plants with 20 or more employees. Names of companies and plants, as well as purchasing, production, engineering, and general managers will be in the guides (Page 55).

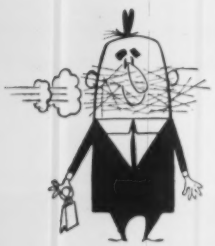
More Crackdowns on Mergers?

Victor Hansen, outgoing federal antitrust chief, predicts a stepped up attack on mergers, particularly in new and growing industries, following the Justice Department's success against the proposed marriage of Bethlehem Steel Corp. and Youngstown Sheet & Tube Co. Mr. Hansen notes the department has "already moved into major new investigations in the automobile and steel industries which we have long had under consideration." Other industries to be scrutinized: Chemicals, plastics, and electronics.

Sides Won't Meet in Wildcat Strike

Union and company officials have refused to meet in the strike which has idled 2000 steelworkers at the Woodward Iron Co., Birmingham. The company terms the walkout by 600 members of USW Local 1099 "a wildcat, illegal and unauthorized." USW district officials agree it is "unauthorized." It began when a worker was suspended for refusing an order.

Straws in the Wind



United Steelworkers will make a big, but superficial, point of a shorter workweek in negotiations this summer. Labor sources say the union won't picket for fewer hours, will leave the big fight to the UAW in 1961 . . . U. S. aircraft sales in 1959 will not exceed last year's total of more than $10 billion, says John A. Dundas, executive vice president of Douglas Aircraft Co. Inc. . . . February employment of hourly and salaried workers in the iron and steel industry was 580,354, a gain of 80,000 (16 per cent) over the low of May, 1958 . . . Silicon power transistor prices have been slashed as much as 30 per cent by Westinghouse Electric Corp. . . . Bethlehem Steel Co. will build a rolling mill at Steelton, Pa., to produce reinforcing bars; construction will be finished by the end of 1960, and the plant will have an annual capacity of 350,000 tons.

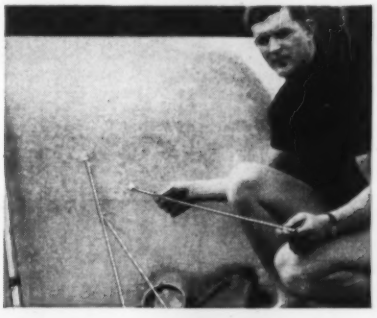
Photograph by famous underwater hunter-photographer Jim Thorne

DEEP SEA HUNTER FAILS TO FLAKE INLAND TI-CO®

More than a match for ferocious 700-pound hammerhead sharks, this compressed-air powered gun fires underwater spears with terrific force. Again and again its high-speed missiles pierced this Inland TI-CO galvanized sheet, yet at the edges around the holes there wasn't a trace of flaking of the zinc coating.

Yes, you can perforate TI-CO sheets. You can subject them to deep-drawing, spin-drawing, punching, crimping, Pittsburgh lock-seaming, in fact the toughest fabricating processes—*but you won't flake TI-CO!*

No wonder TI-CO galvanized sheets are top-choice with manufacturers in such a wide variety of new applications and products. TI-CO is manufactured with dry, oiled or chemically treated surfaces to meet your production needs. It comes in sheets or coils in gages 8 to 30 inclusive and in widths as great as 60 inches. Specifications, application and performance data, complete information, is all contained in a free TI-CO booklet we'll be glad to send at your request. For your galvanized sheet or coils requirements, consult your Inland representative.



Close-up inspection shows no flaking of TI-CO's zinc coating

INLAND

INLAND STEEL COMPANY

30 West Monroe Street • Chicago 3, Illinois

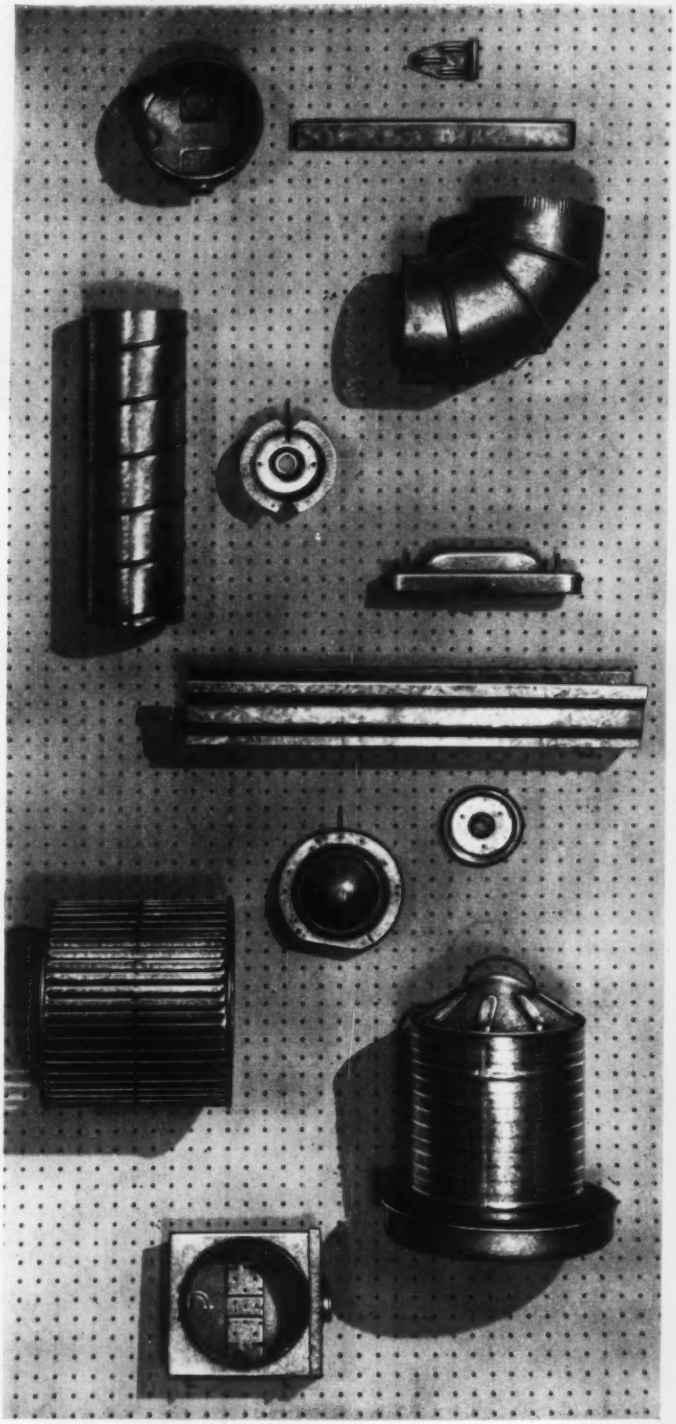
Sales Offices: Chicago • Davenport • Detroit • Houston • Indianapolis • Kansas City • Milwaukee • New York • St. Louis • St. Paul

New steels are born at Armco

ARMCO ZINCGRIP STEEL

draw
form
lockseam
work it to the limit of its ductile steel base. The full-weight coating of zinc *s-t-r-e-t-c-h-e-s*— doesn't flake or peel. Parts stay zinc-protected, rust-resistant.

For more information about workable, zinc-protected Armco ZINCGRIP® Steel, just fill in and mail the coupon.



ARMCO STEEL CORPORATION
1829 Curtis Street, Middletown, Ohio

Please send more information about Armco ZINCGRIP Steel.

We make_____

NAME_____ TITLE_____

FIRM_____

STREET_____

CITY_____ ZONE____ STATE_____

ARMCO STEEL

Armco Division • Sheffield Division • The National Supply Company • Armco Drainage & Metal Products, Inc. • The Armco International Corporation • Union Wire Rope Corporation • Southwest Steel Products

Revolution in Autos!

You need no better evidence of the revolution taking place in the automobile industry than the International Auto Show at the New York Coliseum last week.

Foreign cars, with their emphasis on economy, have captured the fancy of the American public.

In 1955, imports of 57,000 cars were an infinitesimal seven-tenths of 1 per cent of U. S. production, an all-time high of 7.9 million. Imports were only a minor irritation to American carbuilders.

In 1957, imports of 259,000 were less than 5 per cent of U. S. production of 6.1 million. They were attaining some significance.

In 1958, imports of 378,000 comprised a whopping 9 per cent of U. S. production of only 4.2 million units.

In 1959, imports of more than 500,000 could account for as much as 10 per cent of U. S. production—now estimated at 5.5 million.

The steep uptrend in imports has convinced the auto industry that the American people no longer want to drive a 2 ton behemoth 2 miles to a drugstore for two packs of cigarets weighing 2 ounces.

The industry will attempt to satisfy changing American tastes with three new small cars emphasizing compactness and economy. But are their prices (over $2000) right? Popular imports have a market established in the $1600 range. Another slice of the market may be taken by the midgets, including the Japanese Daihatsu. Their price is in the neighborhood of $1000.

As American and European builders vie for markets, you may see more changes in autos.

Perhaps sheet metal distorted into gull wings and shark fins will give way to aerodynamic styling with the skin running underneath the body.

Perhaps the dream cars of the future will be driven by four electric motors powered by electrochemical fuel cells and guided on intercity trips by electronic speed and guidance control systems.

In the less fanciful present, the revolution in autos is showing up in revamped material specifications, engineering changes, and use of more standardized parts.

It is a revolution you will want to watch, whether you work for an automobile company, supply auto parts, operate a garage, or just drive a car.

Irwin H. Such

EDITOR-IN-CHIEF

a new plan to give you

INCREASED VALUE in BUYING METALS

Never before have all the values of this new plan been available to you—from Ryerson or from any other source. Outlined here are some of the principal advantages—each representing many possibilities it will pay you to explore.

INVENTORY ADVANTAGES

1. Ryerson inventories now at all-time high. No others anywhere even come close in size and diversity.
2. The newest steels first. Typical examples: LEDLOY® tubing, LEDLOY 375 bars, new leaded alloys.
3. Hard-to-get intermediate sizes and special analyses—plus, of course, practically all standard types and sizes.
4. High inventories are scheduled to be maintained throughout the year, *regardless* of market conditions.

VALUE ANALYSIS ADVANTAGES

1. New quality-control standards, completely detailed and published, govern every aspect of the specifications, inspection and certification of *all Ryerson products.*
2. New closer cutting tolerances assure greater accuracy than ever before available.
3. The industry's most experienced specialists—well qualified to work with you on problems of selection fabrication and "costs of possession" analysis—help you achieve optimum value in purchase *and* use of steel, aluminum, industrial plastics and metalworking machinery.

BETTER SERVICE

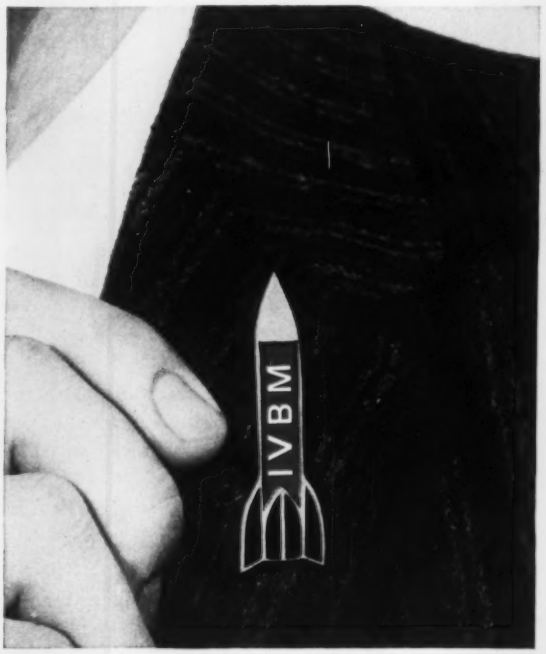
1. Stepped-up processing assures even faster, more dependable delivery of regular requirements.
2. Unequaled capacity to serve—a combination of expanded stocks, equipment and staff—means unequaled ability to meet the most urgent emergency needs *faster.*

MORE FOR YOUR PURCHASING DOLLAR

In addition to all the advantages listed above, you build a business relationship with a company that:

1. Is nationally recognized as the leader in its field.
2. Values your respect and patronage much too highly to sacrifice your long-term good will for any immediate gain.
3. Has supplied high-quality products at fair, established prices under all market conditions for more than a hundred years.

Your Ryerson Representative can show you how Ryerson products and services are saving money, improving quality and stepping up production for hundreds of companies. Just ask him what's behind that rocket lapel pin he's wearing, and what it means to you.



HERE'S WHAT EVERY RYERSON MAN IS WEARING—This little rocket lapel pin symbolizes Ryerson's new plan for you—I.V.B.M.—Increased Value in Buying Metals. Ask your Ryerson Representative about it next time he calls.

PRODUCTS IN STOCK

STEEL—carbon, alloy, and stainless steel—bars, structurals, plates, sheets and strip, tubing, etc.

ALUMINUM—sheet and plate, coils, rod and bar, tubing and pipe, building products, etc.

INDUSTRIAL PLASTICS—Ryertex-Omicron PVC in all forms. Also Ryertex® laminated phenolic plastics for bearings, etc.

METALWORKING MACHINERY—the broadest line available from a single source for every kind of metal fabrication. Also specialized line of material handling equipment.

RYERSON STEEL®

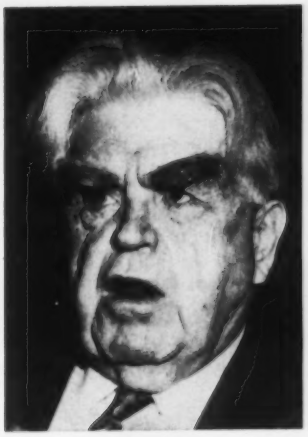
Member of the Inland Steel Family

STEEL • ALUMINUM • PLASTICS • METALWORKING MACHINERY

NATION'S MOST COMPLETE SERVICE CENTERS IN PRINCIPAL CITIES COAST TO COAST

DAVID J. McDONALD

WALTER REUTHER



JOHN L. LEWIS

Can Unions Find New Leadership in '60s?

IF YOU THINK you'll have problems as an industrial manager in the 1960s, stop for a moment to see what's bothering union leaders about the future.

Their concerns may shed new light on yours, too.

STEEL checked with some labormen (who would talk) and found two problems are at the bottom of their worries:

1. With few exceptions, most of today's important labor leaders (the Lewises, the McDonalds, even the Reuthers) are middle aged or older. Bright young men are scarce in the labor movement.

2. Whitecollar jobs are growing faster than the bluecollar variety, but whitecollar people are slow to join unions.

Middle Age

"American unionism has reached institutional and psychological middle age," says Princeton's Dr. Richard Lester. Like the father with a paunch and receding hairline, it tends to distrust youth.

Joseph Amann, president, Engineers & Scientists of America, an independent whitecollar union, and Dr. S. M. Vinocour of *Foreman's Magazine* claim that few young leaders with potential are allowed to advance far up the union ladder for fear they'll challenge the old leader. "Too many around today's leaders are yes men. There is rarely a cabinet, usually only direction from the top down," concludes one observer.

Dr. Vinocour thinks it noteworthy that published photographs of union leaders are creating a stereotype of fat, cigar smoking individuals. Management appears more as the lean, aggressive, young fellow on his way up. Mr. Amann notes a trend in the colleges to teach management's point of view, a reversal from the viewpoint in many colleges of a decade or more ago.

New union leadership is needed, says Mr. Amann. He counts Walter Reuther as one of the few with "a sense of social responsibility," and thinks the next decade's leaders will come from among those younger men now holding staff positions in the unions.

Dr. Vinocour is not so sure. He

MAJOR QUESTIONS

Union Leaders of '60s Must Answer

1. Should unions encourage or fight the trend toward more employee stock ownership?
2. If they fight it, what alternative do they have to offer members?
3. Should organized labor continue to fight profit sharing plans, or should it embrace the practice?
4. What kind of profit sharing can it demand for its members if it keeps fighting industry's version?
5. Are increasing federal social security benefits helping or hurting the union cause?
6. Should labor recognize the trend to more whitecollar and fewer bluecollar jobs by going after higher salary schedules rather than hourly wages to appeal to the whitecollar workers?
7. How can membership be increased proportionate to the labor force as the percentage of production workers tends to fall?
8. How can orderly succession of union management be assured?
9. How can labor attract the engineers?
10. What can unions do to regain prestige lost in the colleges during the last decade?

believes that many of the young men now in the labor movement are not particularly union types. They could have ended on the management side of the fence if they had not happened to hear "a union seminar at the New School for Social Research, City College of New York, or Columbia." They are the economists, the comptrollers, the secretaries, the public relations directors of the unions who, Dr. Vinocour thinks, will be dominated by the old business agent types.

He sees "a general expert in communications, a leader with a socioanthropological point of view," as the union man of the future, if the labor movement is to maintain its power in the face of static or declining membership. From a political point of view, he suggests the unions are rich enough to afford a leader like Nelson Rockefeller, "the philanthropic stereotype," which it appears is becoming more popular in this middle class society.

He suggests business groups will tend to move similarly to find people not directly associated with their interests. The U. S. Chamber of Commerce is a case in point. It has elected Erwin Canham, editor, *Christian Science Monitor*, as its president.

Industry trade associations have for some time been hiring outsiders for their reputation, administrative ability, and freedom from internal organizational conflicts. The unions may take a leaf from their book.

That's why more than passing attention is going to one rumor making the rounds: The successor to ailing John L. Lewis may be a Maryland politician.

From Blue to White

The second basic problem facing unions is this: The whitecollar segment of the work force is growing faster than the bluecollar group. The new leader must find new approaches to cope with the trend. Mr. Amann believes that the methods used to attract bluecollar members won't work on the whitecollar people. They are skeptical of standard union promises. Labor has not dispelled the whitecollar social stigma attached to union membership.

But the facts clearly show that unions must modify their approach to grow. The Labor Department estimates that the labor force grew by about 3.5 million from 1955 to 1958. STEEL estimates that the AFL-CIO picked up 1.3 million new members during the period, while independent or unaffiliated unions barely held their own.

The National Planning Association, Washington, says that salesmen, clerks, and service workers are on the increase. But look at what's happening to production workers: From 1947 to 1957, says James Stern of the United Auto Workers, production worker employment has increased by only 1 per cent. An AFL-CIO spokesman tells STEEL: "The only place we have to go now is into the South and the whitecollar class."

David McDonald, United Steelworkers' president, commented at a recent press conference: Possibly 100,000 of the 200,000 unemployed steelworkers (compared with prerecession employment levels) may never go back to work in steel because of increased worker productivity brought about by cost cutting and installation of automatic machinery.

Efforts to hold membership are also in evidence. The UAW last year granted its skilled workers, engineers, and technicians the right to vote separately on contractual issues relating exclusively to them. Said Vice President Leonard Woodcock: "It is an inescapable fact that if we cannot achieve the organ-

ization of professional, technical, and engineering employees, and also office workers, this union will become an increasingly less effective force."

In some missile and ordnance plants, almost 50 per cent of the labor force is nonproduction workers. David Lasser, IUE research director, pinpoints labor trends in the Space Age by calling the 1957-58 recession "the first automation recession." Mr. Stern predicts that by 1980 there will be three white-collar workers for every production worker in the chemical industry. A decade ago the ratio was 4 to 1 in favor of production workers.

Drastic Changes Ahead

Mr. Amann thinks the new leader will eventually emerge. He predicts "drastic changes, perhaps not in ten years, but in 20 probably." First, he thinks, the unions will settle down into ten major ones, built on "spiritual" areas of interest, not on industrial lines. Then look for the scientists, engineers, and subprofessionals to line up with craftsmen like toolmakers, electricians, and diesetters because of "their attitude toward their work."

He believes the engineers will gain power numerically as well as within union circles. "They are becoming more significant in keeping an enterprise going. If Mr. Reuther called a strike today at an auto plant, the engineers and technicians could keep it running."

For unions to grow in the 1960s, says Dr. Vinocour, they'll have to achieve social responsibility and "broad spectrum of views." To harp on social security and Taft-Hartley is old fashioned and pointless, admits at least one union leader. Those problems are solved in the minds of most people.

Signs of new movements stirring in organized labor can be seen in events like Don Rarick's rebellion in the steel union. It failed because the old guard led by Dave McDonald was too entrenched and, also, suggests Mr. Amann, because the younger men themselves have not yet developed "the broader vision needed."

• *An extra copy of this article is available until supply is exhausted. Write Editorial Service, STEEL, Penton Bldg., Cleveland 13, Ohio.*

Magnesium Output Off, But 2nd Producer Enters Field

	(Thousands of net tons)		
	PRODUCTION	SHIPMENTS**	
	Ingots	Wrought	Cast
1959*	30.2	11.4	14.6
1958	30.1	9.3	13.6
1957	78.9	10.9	15.1
1956	68.3	12.7	18.0
1955	61.1	10.5	13.9

Sources: Bureaus of Mines and Census.
*Estimated.
**Does not indicate total annual consumption.

DOW CHEMICAL CO. will have a competitor when Alabama Metallurgical Corp. starts reducing prime magnesium at its Selma, Ala., plant in September. Lester G. White, Alabama Met's president, says the facility will have an initial capacity to turn out 6800 tons of high purity ferrosilicon magnesium annually. Dow's yearly capacity is 83,000 tons.

Metalworking believes that the entry of a second producer may ultimately result in a reduction in the price of magnesium—it now sells for 36 cents per ingot pound, f.o.b. Dow's Velasco, Tex., shipping point. The move can also open new marketing doors for Brooks & Perkins Inc., Detroit, and Calumet & Hecla Inc., Chicago, its joint owners. E. H. Perkins Jr., Alabama Met's vice president, says most of the output will be for sale, although Brooks & Perkins will use some of it. Last year, B&P used less than 1000 tons of the metal.

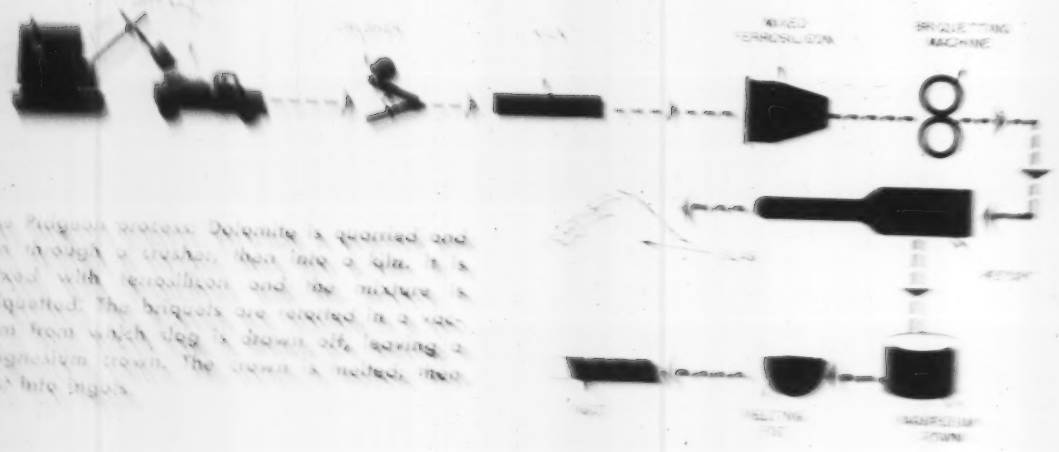
• **Welcome** — Competition doesn't frighten Dow. It probably has been more concerned about the lack of it. (Actually, one other company is in the field: The government, through New England Lime Co., has been operating a 5000 ton captive plant at Canaan, Conn.) Says Dow: "We welcomed Alabama Metallurgical Corp.'s announcement of plans to produce primary magnesium, and we continue to welcome competition in this industry. We believe competition will be beneficial for both the magnesium industry and the nation."

The Midland, Mich., firm adds that its Freeport, Tex., plant, which has been at half capacity, is expected to go into full production this summer. Dow's Velasco, Tex., facilities have been absorbed into the Freeport plant.

• **Foresight**—The new corporation was formed jointly by Brooks & Perkins and Dominion Magnesium of Canada in 1956. From Dominion, B&P acquired certain assets and data, including the Pidgeon process of refining high purity magnesium from dolomite. Dow reduces its metal electrolytically from sea water. Dolomite comes from Alabama Met's quarry about 60 miles north of Selma near Ryan, Ala.

To obtain additional capital, Brooks & Perkins bought out Dominion and reorganized with Calumet & Hecla last year. Lester G. White, Dominion's former managing director and the man who built

How Magnesium Is Made



The Pidgeon process. Dolomite is quarried and ore is brought to crusher, then into a kiln. It is mixed with ferrosilicon and the mixture is briquetted. The briquets are charged in a retort from which slag is drawn off, leaving a magnesium crown. The crown is melted and cast into ingots.

that Mr. Perkins says the company is importing "magplate" from Canada despite a 50 per cent ad valorem cost penalty per carload. This obviously will be a prime market for AMC.

• **Common Uses** — Conventional uses include wrought and cast products for aircraft and missile use. Luggage is a growing market. Present automotive usage is less than a pound per car, but some magnesium men say that if the price drops to around 30 cents a pound, automakers would take between 25,000 and 50,000 tons a year. Chrysler Corp. still specifies magnesium as an optional material for many parts now made from aluminum, but the industry generally is avoiding it because it's afraid of single sources and because the price is too high.

• **Price**—The possibility of lower prices is intriguing. Costs are closely guarded. Guesstimates range from 14 to 28 cents a pound, but 22 to 24 cents seems to be pretty realistic. While Dominion's costs (using the ferrosilicon process) reportedly are slightly higher than Dow's, Alabama Met says it has made some definite improvements over the Canadian firm's older facilities. Both American companies say they will be competitive pricewise.

With Alabama Met's limited capacity, a price cut doesn't seem likely soon, but as capacity increases and as the market for magnesium grows, price reductions are probable. The pressure for a price cut will grow if another competitor enters the arena—a rumor of long standing makes one of the aluminum companies a possibility, but no such move is imminent.

• **Outlook** — The market for magnesium is making a recovery. Dow figures 1959 consumption at 45,000 tons vs. about 35,000 tons last year. Production won't be increased because of inventories left from 1958.

GE Builds Japan Reactor

An $8.5 million contract for a 12,500 kilowatt atomic reactor has been awarded to General Electric's Atomic Power Equipment Dept., San Jose, Calif. To be completed sometime in 1960, it will be the first reactor in operation there.

New Market Guide Coming

Dun & Bradstreet to publish metalworking directories that will pinpoint markets

A NEW DIRECTORY will soon take the uncertainty out of identifying your customers and establishing market potentials.

Dun & Bradstreet Inc. will issue a national and five regional editions of a detailed metalworking marketing directory in November, says J. Wilson Newman, president of the company.

• **Comprehensive Listings**—The national directory will list 30,000 metalworking plants with 20 or more employees. It will categorize plants geographically, alphabetically, by products, and include a statistical summary. For the first time, you will be able to plan sales campaigns using one authoritative source which names companies and plants, as well as purchasing, production, engineering, and general managers. Further refinements: Primary and secondary products manufactured; number of employees, products in 170 Standard Industrial Classifications (in the four digit category); and county and state locations of plants by SIC codes and number of employees.

Regional directories will list information needed to determine sales potentials and identify sales prospects by geographic areas and SICs.

• **Testimonial**—Dun & Bradstreet selected 100 companies for a prepublication sales test. Result: Orders for 27 national and 24 regional directories. The company anticipates leasing several thousand books.

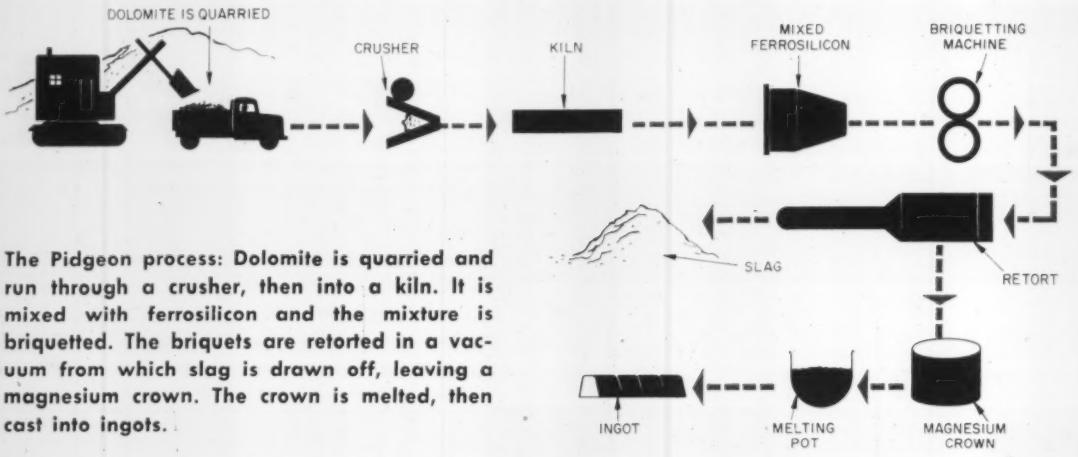
• **Directory Uses**—Respondents to a 55,000 plant survey indicated: 52 per cent will use the guides to classify and identify new prospects; 39 per cent to establish market and customer potential; 25 per cent to identify sales contacts; 20 per cent to establish sales territories; and 11 per cent to set sales quotas.

• **Market Gage**—Marketing studies will be facilitated through an additional service which will be offered on a fee basis, says Mr. Newman. All information in the directories, except names of personnel, will be punched in cards and made available to subscribers. Marketing managers will be able to establish relationships involving numbers of employees, products, and sales—then determine possible sales volumes to prospective customers.

• **Based on Needs**—Dun & Bradstreet became interested in publishing the directories after evaluating the response to a complete census of all manufacturing firms in New England about five years ago. The company found that 60 per cent of the requests for the census information concerned metalworking plants employing 20 or more.

• **Annual Issue**—Dun & Bradstreet's 1600 field reporters, operating out of 140 U. S. offices, will obtain information annually from companies that have three or more branch plants. Information about other plants will be updated yearly through mailed surveys and the field reporters will follow up on plants that have not answered by the third mailed request. New books will be published each year.

How Magnesium Is Made



The Pidgeon process: Dolomite is quarried and run through a crusher, then into a kiln. It is mixed with ferrosilicon and the mixture is briquetted. The briquets are retorted in a vacuum from which slag is drawn off, leaving a magnesium crown. The crown is melted, then cast into ingots.

its dolomite facilities, was named president. H. Y. Basset of Calumet & Hecla is chairman. Brooks & Perkins owns 30 per cent of Alabama Met's stock. C&H owns 70 per cent.

• **Facilities** — Construction of the $3.5 million Selma plant on a 480 acre site started last year. Initial employment will be 175. Other facilities will be added as soon as the company is sure demand warrants it. A good bet: Initial capacity will be doubled within 18 months.

As part of its expansion program, Mr. Perkins reports the company will build its own ferrosilicon plant at Selma. Meanwhile, it will import ferrosilicon from Norway—apparently, it has a 3 to 4 cent price advantage over domestically produced ferrosilicon.

• **Markets**—The big interest is in marketing magnesium. Alabama Met says it can guarantee metal which is 99.95 per cent pure. The Atomic Energy Commission wants the high purity product for its uranium production.

Uncle Sam is getting such metal from the captive plant at Canaan, but New England's management contract expires in June. It's expected to be renewed, but Washington sources say the Canaan facility probably will go up for sale by 1962, along with another World War II plant operated by Brush Beryllium Co. at Luckey, Ohio. Plants at Manteca, Calif., Wingdale, N. Y., and Painesville, Ohio, are expected to be put up for sale this year.

If the AEC goes out of the business, it will have to obtain its high purity magnesium from other sources. Government policy prohibits buying from foreign producers. Alabama Met hopes it will get the nod, although Dow has developed a special grade that's 99.924 per cent pure. "Dow's Grade 5 magnesium has been tested by the Atomic Energy Commission, and the AEC believes it will be satisfactory for uranium production," says that firm. How much the AEC will use isn't known, but it appears to be good for at least 2200 tons annually.

• **Alloys**—Brooks & Perkins, a magnesium fabricator, has investigated other high purity metal markets. Magnesium is used in refining zirconium, a high temperature resistant alloy for atomic fuels and some missile applications. Titanium is another growing market (see STEEL, July 14, 1958, p. 116). Higher quality metal can be made when magnesium is used in the Kroll reduction process.

Entry into the missile field in the form of solid propellent fuels is less likely. Despite some limitations, it may be that magnesium alkyls offer certain advantages over aluminum powdered fuels. (The difference is in combustion rates.)

Gas cooled atomic reactors like the Calder Hall project in England use magnesium as a fuel cell material because it permits freer passage of neutrons than aluminum or steel. The finned fuel cans require a special magnesium alloy. They contain a uranium rod about 4 ft long and 1 in. in diameter. Several thousand cans are needed to load a reactor like Calder Hall's. Brooks & Perkins has developed several new alloys that should fill the bill. They'll use high purity magnesium. At least two gas cooled reactors are under development in this country, and Mr. Perkins indicates this can be a substantial market.

In less esoteric fields, metalmen are finding new uses for powdered magnesium parts. Brooks & Perkins also thinks the ferrosilicon metal is better than electrolytic for photoengraving plates. It's so convinced

that Mr. Perkins says the company is importing "magplate" from Canada despite a 50 per cent ad valorem cost penalty per carload. This obviously will be a prime market for AMC.

• **Common Uses** — Conventional uses include wrought and cast products for aircraft and missile use. Luggage is a growing market. Present automotive usage is less than a pound per car, but some magnesium men say that if the price drops to around 30 cents a pound, automakers would take between 25,000 and 50,000 tons a year. Chrysler Corp. still specifies magnesium as an optional material for many parts now made from aluminum, but the industry generally is avoiding it because it's afraid of single sources and because the price is too high.

• **Price**—The possibility of lower prices is intriguing. Costs are closely guarded. Guesstimates range from 14 to 28 cents a pound, but 22 to 24 cents seems to be pretty realistic. While Dominion's costs (using the ferrosilicon process) reportedly are slightly higher than Dow's, Alabama Met says it has made some definite improvements over the Canadian firm's older facilities. Both American companies say they will be competitive pricewise.

With Alabama Met's limited capacity, a price cut doesn't seem likely soon, but as capacity increases and as the market for magnesium grows, price reductions are probable. The pressure for a price cut will grow if another competitor enters the arena—a rumor of long standing makes one of the aluminum companies a possibility, but no such move is imminent.

• **Outlook** — The market for magnesium is making a recovery. Dow figures 1959 consumption at 45,000 tons vs. about 35,000 tons last year. Production won't be increased because of inventories left from 1958.

GE Builds Japan Reactor

An $8.5 million contract for a 12,500 kilowatt atomic reactor has been awarded to General Electric's Atomic Power Equipment Dept., San Jose, Calif. To be completed sometime in 1960, it will be the first reactor in operation there.

New Market Guide Coming

Dun & Bradstreet to publish metalworking directories that will pinpoint markets

A NEW DIRECTORY will soon take the uncertainty out of identifying your customers and establishing market potentials.

Dun & Bradstreet Inc. will issue a national and five regional editions of a detailed metalworking marketing directory in November, says J. Wilson Newman, president of the company.

• **Comprehensive Listings**—The national directory will list 30,000 metalworking plants with 20 or more employees. It will categorize plants geographically, alphabetically, by products, and include a statistical summary. For the first time, you will be able to plan sales campaigns using one authoritative source which names companies and plants, as well as purchasing, production, engineering, and general managers. Further refinements: Primary and secondary products manufactured; number of employees, products in 170 Standard Industrial Classifications (in the four digit category); and county and state locations of plants by SIC codes and number of employees.

Regional directories will list information needed to determine sales potentials and identify sales prospects by geographic areas and SICs.

• **Testimonial**—Dun & Bradstreet selected 100 companies for a prepublication sales test. Result: Orders for 27 national and 24 regional directories. The company anticipates leasing several thousand books.

• **Directory Uses**—Respondents to a 55,000 plant survey indicated: 52 per cent will use the guides to classify and identify new prospects; 39 per cent to establish market and customer potential; 25 per cent to identify sales contacts; 20 per cent to establish sales territories; and 11 per cent to set sales quotas.

• **Market Gage**—Marketing studies will be facilitated through an additional service which will be offered on a fee basis, says Mr. Newman. All information in the directories, except names of personnel, will be punched in cards and made available to subscribers. Marketing managers will be able to establish relationships involving numbers of employees, products, and sales—then determine possible sales volumes to prospective customers.

• **Based on Needs**—Dun & Bradstreet became interested in publishing the directories after evaluating the response to a complete census of all manufacturing firms in New England about five years ago. The company found that 60 per cent of the requests for the census information concerned metalworking plants employing 20 or more.

• **Annual Issue**—Dun & Bradstreet's 1600 field reporters, operating out of 140 U. S. offices, will obtain information annually from companies that have three or more branch plants. Information about other plants will be updated yearly through mailed surveys and the field reporters will follow up on plants that have not answered by the third mailed request. New books will be published each year.

Atomic Swords Become Plowshares

NUCLEAR SCIENTISTS looked beneath the oceans, dug under the earth's crust, and probed space at the Fifth Nuclear Congress & Atom Fair in Cleveland. The theme: Converting atomic "swords into plowshares."

• Hughes Aircraft Co. is constructing a mobile robot that can see with television eyes and handle radioactive materials in "hot" areas.

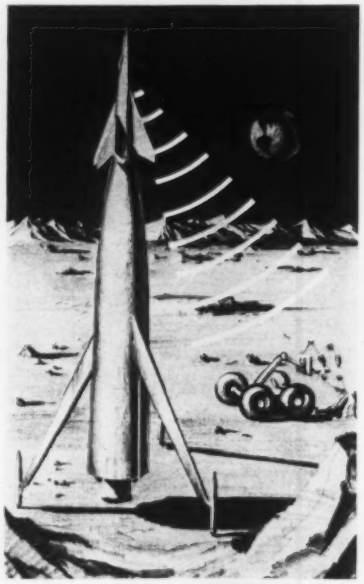
It has been designed with flexible steel hands and will duplicate many functions of a man, though "it will look more like a fork lift truck" than anything else, says Dr. John W. Clark, head of Hughes's Nuclear Electronics Dept.

The concept of the remote control handling machine evolved as a result of Hughes's experiments in its new underground nuclear laboratories where scientists are measuring the effects of atomic radiation upon electronic components. The Russians plan a similar device, but, Dr. Clark notes: "It's only in the cartoon stage."

Hughes is completing the first Mobot to meet research requirements of an unnamed purchaser and is planning three other versions. Delivery of the first machine is scheduled in July. Cost: $25,000 to $500,000, depending on equipment requirements.

The Mobot manipulator may accompany the first man to the moon. The model under construction may become the granddaddy of a long line of machines which will do many jobs and bear little resemblance to their ancestor. At the Atom Fair, a sketch of a Mobot depicted a huge, double nosed, insectlike machine on the surface of the moon. It would be used for collecting samples of moon rock and moon dust under radio-TV direction from a man who accompanies the Mobot to the moon by rocket. The man remains safely in the spaceship's interior.

Dr. Clark says that a family of Mobots could do anything at 90 fathoms that they could do on dry land. Examples: Lift a deadweight ton, sink an oil well, or dig a mine-



Hughes Aircraft Co.

Mobot (shown at right) could perform dangerous collecting tasks on the moon while men transmit radio orders from the safety of a rocketship

shaft. An underwater Mobot could be controlled from shore stations, barges, or submarines. Crablike Mobot machines could plant and harvest kelp, seaweed, and other plants in the unexploited sea regions, to feed the world's future populations, Dr. Clark says.

In radioactive areas, the Mobot receives electronic signals to pick up and move materials while the operator stands safely in a room far removed from the shielded laboratory. Television cameras on the walls of the hotroom and atop the slave machine afford the operator full views of the work area. The Mobot can be equipped with wrenches, screwdrivers, hammers, and shears for dismantling radioactive equipment. Its electropneumatic fists and fingers can be adjusted for a light touch or a 200 lb squeeze.

• Scientists also discussed recovering oil by using a nuclear explosive to shatter and fracture oil shale.

In the proposed experiment, a 10 kiloton nuclear device would be detonated in the Green River oil shale somewhere in Colorado. (See STEEL, Mar. 2, p. 78.) The blast would shatter about 300,000 tons of shale. Estimated cost: $2.6 million for the nuclear device and processing of the shale. The experiment would provide technical information needed for a feasibility determination, says C. C. Anderson, chief petroleum engineer, Bureau of Mines. He spoke before a session on "Potential Applications for Peaceful Uses of Nuclear Weapons" at the National Industrial Conference Board's seventh Atomic Energy in Industry Conference, held jointly with the Atom Fair & Nuclear Congress.

A cost study for a large scale operation has been made to give a rough idea of economic possibilities.

A 300 kiloton device could shatter about 35 million tons of 28-gallon-per-ton oil shale. The costs were estimated for a plant and wells to recover 3000 barrels of shale oil per day, or more than 11 million barrels in 10 years, assuming a recovery factor of 47 per cent. The capital costs, including the nuclear device: $4,730,000 to $6,170,000. Cost per barrel: Roughly $2 to $3.

• Radioisotopes are proving to be versatile tools in research, development, and testing at Douglas Aircraft Co.

Though profit analysis is elusive in those areas, the company estimates it saved about $70,000 by using radioisotopes to determine fluid contamination effects on wear and operating characteristics of servovalves in the Thor control system. The company also evaluated the effectiveness of several line filters which protect the valves.

The information was gathered by tracing a radioactive tagged powdered iron contaminant with a scintillation counter. The filter failures and subsequent buildup of contaminants on the valves were "seen" without disassembly.

Aside from the basic instrumentation, such as a flow counter and

scaler, the tools required are a few tagged organics costing $100 to $300, says Robert M. Brown, group leader of the company's radioisotope laboratory.

• General Electric Co. is working on a nuclear powerplant that is scheduled to produce economically competitive electric power in 1970.

The plant will follow evolutionary boiling water reactor plants which the company expects to become competitive with conventionally fueled powerplants in some areas of the U. S. by 1965. With this equipment, water will be converted to superheated steam to produce electricity by means of a turbine generator. Power production cost: About 6.5 mills per kilowatt hour.

Space Predictions By General Dynamics

THE U. S. will be sending manned and unmanned flights into space within the next ten years, predicts General Dynamics Corp. in its annual report to stockholders. It also expects several other achievements during the period:

• Communication and television relay satellites at altitides as high as 22,000 miles in a "stationary," 24-hour equatorial orbit.

• Global weather monitoring from optical satellites circling the globe in polar or highly inclined orbits at altitudes of 4000 to 8000 miles. (This will be routine.)

• Radio-navigation satellites serving surface ships. They'll be in equatorial and inclined orbits at altitudes of 1000 miles.

• One or more relatively small, manned space stations in the equatorial plane at an altitude of about 300 miles. Purposes: Orbital flight training, life-support systems development, and man-conducted research in space.

• Development of auxiliary nuclear power supply systems for the satellites and space stations.

• Establishment of permanent moon satellites and moon-based telemetering stations.

• Exploration of the moon surface by vehicles launched directly from the earth's surface without orbital assembly or fueling.

• Instrumented probes from within the orbit of Mercury to the asteroid belt beyond Mars.

• Dispatch of encounter probes to Venus and Mars and the establishment of instrumented satellites of planets as far out as Jupiter. Essentially, all the projects will be based on chemical rockets, such as the Atlas boosters with advanced chemical upper stages, and a booster with 1.5 million lb of thrust, with both chemical and solid fuel upper stages.

• Nuclear-powered upper stages, boosted into space by chemical first stages, will be available.

• Establishment of international co-operation programs for the scientific and practical usage of satellites, as well as in monitoring and tracking of space vehicles and in control of transmission frequencies.

• The building of at least one new launching complex in the mid-Pacific or near the equator.

• Positioning of "platforms in space" as steps to manned explorations of Venus and Mars.

During the period, the decision will be made to build a permanent, lunar base colony.

More Foreign Agreements

More agreements between U. S. and foreign producers of machine tools, machinery, and equipment have been announced.

Motch & Merryweather Machinery Co., Cleveland, has entered into a manufacturing agreement with Heller Bros., Nuertingen, Germany. It provides for the interchange of engineering data and technical information which will materially assist M&M in its research and product development programs.

David Brown Corp. Ltd. of England will acquire a substantial minority interest in Foote Bros. Gear & Machine Corp., Chicago, if the proposal is approved by Foote stockholders. The English firm makes gears, machine tools and accessories, steel and bronze castings, farm machinery, and tractors. Foote Bros. makes power transmission equipment, gears, and equipment for special purposes.

Milton Roy Co., Philadelphia, has negotiated a ten year license agreement with Electronic Instruments Ltd., Richmond, Surrey, England, for the sale and manufacture of industrial and laboratory pH equipment in the U. S.

NEW CERAMIC MATERIAL for missiles withstands 4000° F, says Boeing Airplane Co., Seattle. Low heat conductivity is demonstrated by oxyacetylene flame on sample held by engineer—no fingers are burned

WILL YOU HELP?

STEEL surveyed 918 top metalworking executives to learn what type depreciation reform they favored (Mar. 2, p. 69). The results: 40.1 per cent want the bracket system; 37.7 per cent want faster writeoffs as advocated by Machinery & Allied Products Institute; 12.7 per cent want reinvestment depreciation; 1.8 per cent want higher first year credit. (At present, you can write off 20 per cent in the first year of acquisition if the property's cost doesn't exceed $10,000.)

Needed is majority support for some kind of reform before Congress will act. To help you evaluate the approaches favored, STEEL in its Mar. 16 issue started a series explaining each of the four most favored types of reform.

This week, we describe the fourth approach. It is based on the higher first year credit.

Relief will come only if you who are sharply affected by depreciation policies will keep plugging for action.

WILL YOU HELP?

Depreciation Reform: Initial Writeoff?

How High First-Year Writeoff Speeds Depreciation

Service Life (Years)	Double-Rate Declining-Balance Depreciation (Per cent)		Sum-of-Digits Depreciation (Per cent)		Straight-Line Depreciation (Per cent)	
	Using Section 179	Not Using Section 179	Using Section 179	Not Using Section 179	Using Section 179	Not Using Section 179
6	46.7	33.3	42.9	28.6	33.3	16.7
10	36.0	20.0	34.6	18.2	28.0	10.0
15	30.7	13.3	30.0	12.5	26.7	6.7
20	28.0	10.0	27.6	9.5	25.3	5.0
25	26.4	8.0	26.4	7.7	24.0	4.0

Source: Machinery & Allied Products Institute.

THIS METHOD of depreciation reform could be enacted by merely changing a few words in Section 179 of the Internal Revenue Code.

The section, made law in 1958, allows a taxpayer to write off 20 per cent of the cost of depreciable property if the deduction is taken in the year of acquisition and the cost of the property does not exceed $10,000.

The reform would remove the $10,000 ceiling.

• **How Section 179 Works**—The first year allowance was passed by Congress with the $10,000 limit as an aid to small business. Many companies think that only those firms employing less than 500 can use it. That is not true. It's available to anybody.

Even with the $10,000 lid, it's a big help.

If you purchase equipment at a cost of $10,000 and choose to apply Section 179, you get a first year

depreciation of $2000, plus the allowance normally allowed (computed on an $8000 basis). The allowance applies only to tangible personal property, used or new, which was acquired after Dec. 31, 1957, and has a useful life of at least six years.

If the cost of your property exceeds $10,000 in a tax year, you may elect items to depreciate on the high first-year writeoff up to $10,000. The limit is doubled in the case of a husband and wife filing a joint return.

• **How It Benefits**—Take a look at the accompanying table to see how the higher initial writeoff would speed your depreciation. The Machinery & Allied Products Institute points out:

"If the initial writeoff were made applicable to equipment without any dollar limitation, it would increase the after-tax return by 6 to 8 per cent for companies now using either sum-of-digits or declining-balance depreciation and by 8 to 10 per cent for firms employing straight-line depreciation."

MAPI adds: "Combined with the benefit of the sum-of-digits or declining balance methods over the straight-line writeoff, increases in after-tax return would range 15 to 25 per cent."

• **Wide Support**—Most of the tax experts checked by STEEL believe removal of the dollar limit in Section 179 would be the easiest way to reform depreciation because a starting point is already on the statute books.

"The provision of an initial writeoff represents an interesting and promising innovation in the American tax system, the use of which may well be broadened in the future," says MAPI.

Taking the lid off Section 179 would have about the same end result as reinvestment depreciation, believes Maurice E. Peloubet, New York accountant (STEEL, Mar 30, p. 54).

The Washington lawyer, Joel Barlow (STEEL, Mar. 16, p. 66) also would favor removing the limit on the initial writeoff.

• An extra copy of this article is available until supply is exhausted. Write Editorial Service, STEEL, Penton Bldg., Cleveland 13, Ohio.

Here Are Depreciation Bills Pending

(Measures introduced to date in the 86th Congress)

H.R. 2 (Introduced by Rep. Frank Ikard, D., Tex.) permits a deduction for additional investment in depreciable assets during the year. The deduction is limited to $30,000 or 20 per cent of the net income of the business for the year, whichever is smaller.

H.R. 131 (Rep. E. J. Keogh, D., N. Y.) permits a deduction for reinvestment depreciation. When replacement assets are purchased, an immediate deduction can be taken for the amount by which inflation increased the cost of the assets being replaced.

H.R. 803 (Rep. Walt Horan, R., Wash.) parallels H.R. 2.

H.R. 1270 (Rep. Melvin R. Laird, R., Wis.) parallels H.R. 2.

H.R. 2812 (Rep. Leonard G. Wolf, D., Iowa) parallels H.R. 2.

H.R. 3000 (Rep. A. S. Herlong Jr., D., Fla.) prescribes maximum useful lives for several broad categories of assets. General purpose machinery and equipment have maximum useful lives of 12 years. The relief would apply gradually over five years. It is limited to property acquired after Dec. 31, 1958, which has a useful life of three years or more.

H.R. 3001 (Rep. Howard H. Baker, R., Tenn.) parallels H.R. 3000.

H.R. 3012 (Rep. Edgar W. Hiestand, R., Calif.) parallels H.R. 2.

H.R. 3607 (Rep. Bruce Alger, R., Tex.) parallels H.R. 3000.

H.R. 3839 (Rep. Perkins Bass, R., N. H.) parallels H.R. 2.

H.R. 4043 (Rep. John Rhodes, R., Ariz.) parallels H.R. 2.

H.R. 3908 (Rep. Gordon L. McDonough, R., Calif.) parallels H.R. 2. It also would permit double declining balance and sum-of-the-digits depreciation for a limited amount of used property.

H.R. 4403 (Rep. Albert H. Quie, R., Minn.) parallels H.R. 2. Deduction is limited to 50 per cent of first $10,000 of additional investment; 30 per cent of next $10,000; and 20 per cent of third $10,000 in any one year.

H.R. 4584 (Rep. O. C. Fisher, D., Tex.) parallels H.R. 3000.

H.R. 4794 (Rep. Paul Cunningham, R., Iowa) parallels H.R. 2.

H.R. 5005 (Rep. Clifford G. McIntire, R., Maine) parallels H.R. 2.

H.R. 5016 (Rep. James Roosevelt, D., Calif.) permits double declining balance and sum-of-the-digits depreciation on a limited amount of used property.

S. 59 (Sen. John J. Sparkman, D., Ala., and 12 other senators) is a companion measure to H.R. 2.

S. 1010 (Senator Sparkman and 13 other senators) is a companion measure to H.R. 5016.

Spring Auto Sales Bloom

For the first time in three years, Detroit is enjoying a tonic as buyers recover from recession. Sales may confirm 5.5 million car year forecasts

LOOK for the spring vigor in auto sales to continue. Ford Div. of Ford Motor Co. has boosted its April car output 20 per cent above original schedules. It plans to build 140,000 cars this month. Truck output has been increased 14 per cent and the division anticipates 30,000 assemblies in April.

Ward's Automotive Reports says the industry plans to build 577,400 cars this month. That's 82 per cent ahead of April a year ago and a slight boost over March, this year (576,085). Most of the increase comes from Ford Motor Co. and American Motors Corp. General Motors Corp. is planning 5500 fewer units than last month. Studebaker-Packard Corp. is off 1000 and Chrysler Corp.'s scheduled April production will about equal March's.

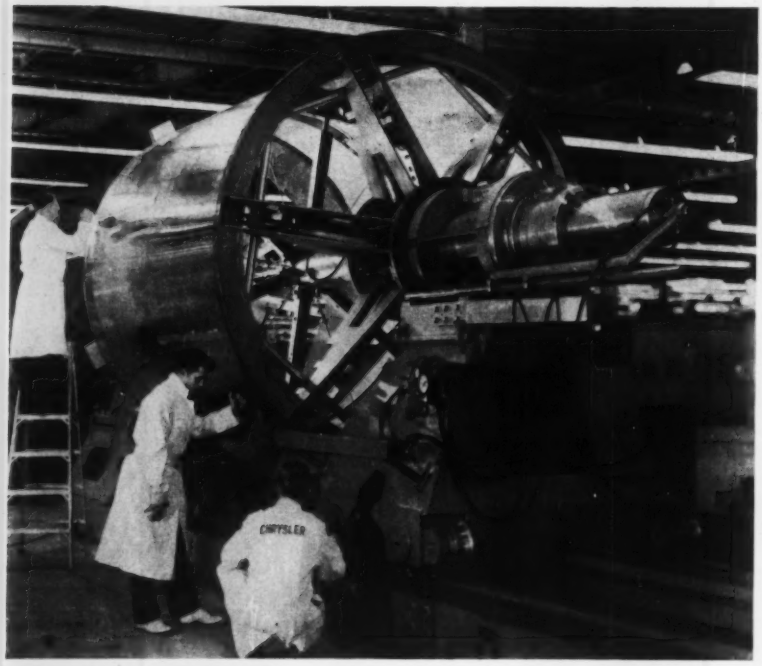
• **Deliveries Up**—The pickup stems from rapidly rising sales, apparently brought on by release of demand pent up during last year's recession. The industry delivered 1.3 million cars this first quarter, a 24 per cent hike over that period last year (see Page 69). Ford is the favored firm. Its conservative styling seems more appealing than Detroit counted on. The company reports January-March sales of 408,300 units. That's 119,400 cars more than the 1958 period. Ford Div. is trailing Chevrolet by only 13,000 sales in the quarter with some 350,000 deliveries.

Cadillac, Oldsmobile, Pontiac, Rambler, and Lark also scored heavy gains in the quarter. Edsel and Mercury are slightly ahead of last year. Lincoln is off 7.5 per cent and Buick sales are estimated to be 12 per cent below 1958's. Chrysler Corp. is about 3 per cent behind last year's quarterly rate with a reported 145,000 units or 11 per cent of industry sales. The company's losses mainly stem from lack of cars during the recent glass strike. Now Chrysler hopes to climb back up to 17-20 per cent of the 1959 market.

• **Fine Market**—Such spring sales vigor, unseen since 1955, has caused marketers to talk about another 6 million car year. It's not likely that sales will go this high, but the surge does seem to confirm that the industry will build its predicted 5.5 million cars. Sales will reach this level, too, if present rates continue.

Add the expected 500,000 imports and you're looking at 6 million market or better.

As a result of increased schedules, the industry is expected to order more steel to replace some tonnages that will be going into production instead of inventory. Additional shipments aren't likely to be too large—they probably will be placed to fill out some of the June rolling schedules which still are open to handle last minute prestrike business.



JUPITER MISSILE FUSELAGE SECTIONS are automatically welded on this fixture at Chrysler Corp., Detroit. Sections are 5086H34 aluminum. All welds presently are x-rayed, but before long Chrysler missilemen expect to scan them with a fluoroscope to cut costs and inspection time. Less than 0.3 per cent of welds need repairing

April Car Production

	1959*	1958
GM	260,800	166,782
FMC	159,100	80,231
Chrysler	100,100	51,864
AMC	40,500	14,349
S-P	16,900	3,277
Totals	577,400	316,503

From *Ward's Automotive Reports*.
*Projected figures.

Buys Battery Laboratory

Electric Storage Battery Co., Philadelphia, has purchased from American Machine & Foundry Co., New York, the assets and business of its Battery Laboratory, Raleigh, N. C. The laboratory is engaged in the development, manufacture, and sale of silver-zinc batteries for missiles and other special applications. The Raleigh facilities will be under the direction of M. G. Smith, vice president of Electric Storage Battery and general manager of its Industrial Div.

Schools Can Handle Your Research

- **Your industry's R&D programs might well begin in university laboratories.**
- **Expensive talent and equipment are available for a fraction of the investment.**
- **Researchers do technical and administrative studies.**

YOUR FIRM may be overlooking a readymade research team if it hasn't investigated university facilities.

Say you have considered the potential for atomic energy applications in your industry but passed over the idea because the cost of nuclear hardware is beyond your budget. A number of universities have extensive facilities for nuclear research.

• School research personnel are ready and eager for projects.

Most qualified members of the technical faculty want to do research in addition to teaching. Graduate students are generally required to make studies to meet degree requirements.

Example: At Case Institute of Technology, Cleveland, A. W. Barkson, a graduate student, put operations research to work on a problem for the Cleveland Electric Illuminating Co. Object: A decision formula to control the inventory of lead covered cable. Mr. Barkson found two possible solutions. The one the company accepted has put cable inventories under control, and it has been applied to other commodities.

• School administrators are more than willing to co-operate.

So willing, in fact, that a research director or faculty member may draft proposed studies for which his staff is best qualified, then try to sell the project to a sponsor. From the university standpoint, attracting sponsor's money pays off by attracting a higher caliber student and faculty member. Projects also contribute to a school's primary job: Widening the fields of knowledge.

• Research may range from metallurgy to mathematical decision making.

Last year, 35 industries contracted with Case Institute for a half a million dollars worth of research. Case's work is typical: It runs from engineering problems in metallurgy (such as the embrittlement of nickel alloy steel) to extensive projects in operations research (such as resource allocation in a steel company, developing optimal policies for minimum cost purchasing, and a model of resource allocation within the firm).

• Basically, you have two ways to underwrite school research.

Sponsorship can take the form of a direct, long term grant in a broad area of study, or it can be established through a negotiated contract. The most obvious difference between the two is that the contract obligation is deductible from income as an expense of doing business, while the free grant may be deducted under the 5 per cent gift rule with carryover provisions.

• Costs vary, so your sponsorship must be negotiated.

A graduate fellowship for one student can be established at Case for $6000 a year. For contract research, the school estimates direct and overhead costs are about $15,000 per man per year. Total costs depend on the project.

• In general, smaller firms write research contracts; bigger ones establish grants.

If you have a limited budget for a given study, you will probably benefit most from contract sponsorship. Contract provisions give you an opportunity to express your terms. For example, you can exercise closer control of the project, arrange for periodic progress reports, and reserve patent rights. The unrestricted grant, which is more often given by the larger companies that have their own research labs by foundations, and the federal government, is usually broader in scope and not significantly controlled by the donor.

• Even without investing, you can keep alert to new ideas generated by research.

Theses and abstracts which report on research are in the public domain. It means that research information is available to you for the asking. All school libraries file research reports of their own students and faculty; theses from a number of universities are available from University Microfilms, Ann Arbor, Mich.

General Electric Co., for example, a major builder of industrial gas turbines, first became interested in the field after reading a doctoral thesis written by a Cornell student, Dr. Sanford A. Moss. He later joined GE to pioneer in the development of the prime mover.

Weather Voted Rust Villain

Weather is the unchallenged champion of rust producing conditions, says Rust-Oleum Co., Evanston, Ill., on the basis of a survey it conducted. Over 4000 chief engineers were polled. Breakdown of votes: Weathering, 33 per cent; chemicals, 14 per cent; humidity, 13 per cent; fumes, 10 per cent. Steam, heat, salt water, smoke, and brine were also mentioned.

Test applications were favored by 64 per cent of the respondents. The report shows coatings are specified on the basis of their rust inhibiting qualities and long wear.

Tax Break Ahead for Foreign Firms?

YOUR future may be in Latin America, Ceylon, or even gay Paree.

If your firm is aggressive, chances are it is seriously considering the advantages of building plants abroad. Many companies have already done so. (There are almost $8 billion worth of U. S. owned manufacturing facilities overseas.) More small and medium sized firms are interested now because of Capitol Hill and White House plans to give foreign investments a better tax break.

A bill by Rep. Hale Boggs (D., La.) represents the Democrats' position. A special report, just released by the State Department, called "Expanding Private Investment for Free World Economy Growth," is described by reliable sources as the administration's plan. Ralph I. Strauss of Massachusetts wrote the report with the assistance from many government agencies. Both approaches stress the so called foreign business corporation (FBC). An FBC would be a domestic corporation which would do most of its business abroad. Mr. Strauss recommends the Internal Revenue Code be amended to defer payment of income taxes on the profits of an FBC until they were distributed to U. S. stockholders "or otherwise diverted from foreign uses."

It is felt that the State Department prefers the FBC approach to increased tax exemptions on foreign investments to meet Treasury Department objections to permanent losses of revenue.

Qualifying as Foreign Corporation

The Strauss report suggests that these characteristics would fit a foreign business corporation: 1. A domestic corporation which gains 90 per cent of its income from overseas through direct trade or equity participation in foreign subsidiaries. 2. It would be exempt from U. S. taxes on income from abroad so long as it paid its taxes on income derived from domestic sources. 3. For income from foreign dividends, interest, and royalty to be exempt, the FBC would have to own 10 per cent of the voting stock of the foreign corporation from which it obtained the revenue. 4. If the corporation obtained more than 50 per cent of its gross income from exports, it would not qualify as an FBC. (Mr. Strauss includes this limitation to prevent qualification of "trading activities that take place with substantial overseas investment.")

Outlook: Mr. Strauss regards the FBC program as the first step toward having private enterprise "carry the whole load" of our foreign aid programs. With Congressional antagonism to President Eisenhower's request for mutual security funds rapidly building up, you can expect the legislators to favor any plan like this.

Overseas Progress Is Sure Bet

Anticipating the argument that more assistance to help foreign countries develop their own industries will tend to decrease our own exports to them and increase the danger of imports threatening domestic industries, Mr. Strauss notes: "History has demonstrated that the highest levels of trade take place between developed countries to their mutual advantage." In other words, if we don't invest overseas, someone else will. The underdeveloped countries would then forge permanent ties with others, instead of with us.

A few congressmen can be expected to argue that the billions already spent on foreign aid should have gained us the permanent thanks of the world. But realistic businessmen point out that the USSR, West Germany, Japan, and even our old ally, Britain, represent new competitive forces in world markets.

Pentagon Asks Renegotiation Addition

Expecting the House Ways & Means Committee to be somewhat sympathetic to proposals to modify the Renegotiation Act, the Pentagon is requesting a 27 month extension to Sept. 30, 1961, which would include recognition of the incentive type of defense contract. One section of the act now requires the Renegotiation Board to recognize the "efficiency" of a contractor, but this has not been enough, says industry, to obtain the full benefits of incentive contracts. The Pentagon seems to agree, and offers this addition to the section: The board must consider, when determining excessive profits, the type contract in force at the time the profits were gained, "especially contracts and subcontracts containing provisions for incentive payments."

This is far afield from the Aircraft Industries Association's request that the first 10 per cent of profits be exempt, but one source in the industry suggests he will be happy with any modifications gained. The Pentagon is willing to go along with Rep. Cecil King's (D., Calif.) proposal to allow appeals to higher courts from U. S. Tax Court decisions.

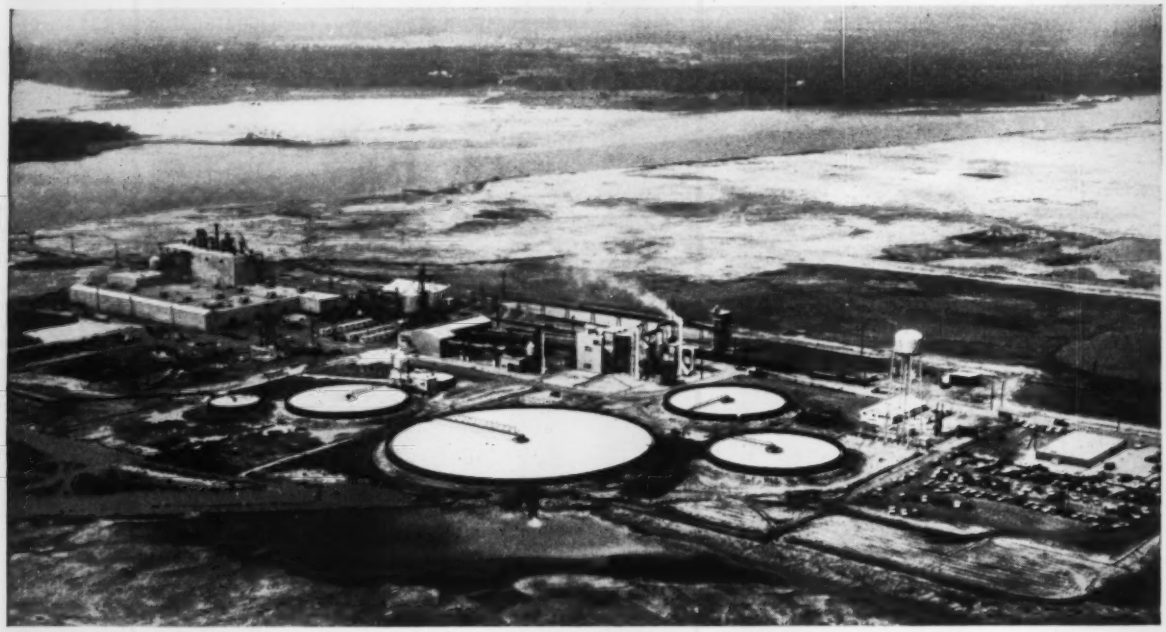
25 x 25 on MORGOIL BEARINGS

We mean a coil of aluminum foil 25 *hundred thousandths of an inch* thick and 25 *miles* long. High quality coils of this size are routine production on this Four High MORGOIL equipped foil mill at Anaconda Aluminum Company, Louisville, Kentucky.

MORGAN CONSTRUCTION CO., WORCESTER, MASSACHUSETTS

ROLLING MILLS • MORGOIL BEARINGS • GAS PRODUCERS
WIRE MILLS • EJECTORS • REGENERATIVE FURNACE CONTROL

Now! Porter goes basic! The first in the south, this new basic refractories plant at Pascagoula went "on stream" **during February**



Porter's new $12 million Pascagoula Works is a sea-water periclase and basic brick facility using the finest in modern equipment in a fully integrated production unit.

Southern industry will soon begin benefiting from faster deliveries and lower freight rates on all forms of basic refractories from H. K. Porter's new Pascagoula Works on the Gulf Coast. Inland waterways, too, will allow easy access to America's industrial heartland.

Products of this new works—Porter's 15th refractories plant—will include burned, chemically bonded, plated and plain brick, mortars, castables, plastics and ramming mixes of chrome and periclase compositions. A unique double-burning process employed in producing Porter periclase grain insures basic refractory products of the highest quality.

Annual output of this new plant indicates an ample, dependable source of supply. Equally important, Porter engineers and ceramists provide the complete customer service that is rapidly becoming recognized as a Porter principle.

For information on shipments, prices, or *any* refractories problem, write *Pascagoula Works, Refractories Division, H. K. Porter Company, Inc., Porter Building, Pittsburgh 19, Pa.*

PORTER BASIC REFRACTORY PRODUCTS

BASIC REFRACTORY BRICK

(burned and chemically bonded in both metal clad and plain categories)

CM-30	Chrome Magnesite
CM-40	Chrome Magnesite (Roof Brick)
MC-70	Magnesite Chrome
Kilmag	Magnesite Chrome (for rotary kilns, offered in burned and plated only)
M-90	Periclase

BASIC REFRACTORY SPECIALTIES

Kromtite	Chrome Air-Set Mortar
Plastikrom	Plastic Chrome Ore
Kromor	Ground Chrome Ore
Kromform	Chrome Castable
Subhearth Kromform	Chrome Castable
Airkrom-C	Coarse Chrome Gun Mix
Airkrom-F	Fine Chrome Gun Mix
Magnaram 85	Periclase Ramming Mix, 85% MgO
Magnaram 95	Periclase Ramming Mix, 95% MgO
Peritite	Periclase Air-Set Mortar

REFRACTORIES DIVISION **PORTER** ***H.K. PORTER COMPANY, INC.***

DIVISIONS: Connors Steel, Delta-Star Electric, Disston, Forge & Fittings, Leschen Wire Rope, Mouldings, National Electric, Riverside-Alloy Metal, Thermoid, Vulcan-Kidd Steel, H. K. Porter Company (Canada) Ltd.

Free Trade, Coal, Prices Dim Common Market Hopes

THE EUROPEAN Common Market is having teething troubles. Prices, a coal surplus, and keeping nonmembers happy are making the infant organization unhappy.

The Common Market was formed from the six nations of the European Coal & Steel Community: Belgium, France, Italy, Luxembourg, Netherlands, and West Germany. It was effected Jan. 1, 1959. Goal: Elimination of tariffs between member nations and establishing one external tariff for the group.

Tariffs have already dropped 10 per cent. Import quotas covering not more than 10 per cent of imports were enlarged 20 per cent. Stipulation: Quotas must admit the equivalent of 3 per cent of the importing nation's production.

• **Free Trade Trumped** — Britain attempted to pressure the market into diminishing "discrimination" against nonmember countries. Some concessions have been made, but generally there is little sympathy for the British complaints. Rebuttal: Britain benefits from lower tariffs and larger quotas. A "preferential" system was denied. The market claims a legitimate differentiation between members and nonmembers.

Last month, the Common Market's executive body rejected a British proposal to extend through negotiation each tariff cut and import quota increase to other Western European countries. Purpose of the English scheme: Establish a free trade area with removal of all tariff and trade barriers.

The market's executive committee has released a report examining the free trade proposal's collapse. The report offers no magic solution, but does suggest a three to four year arrangement by which all Organization for European Economic Cooperation members could make an experimental move toward a permanent intra-European agreement.

• **Steel Price Problem** — The six nations also face internal squabbles.

Devaluation of the franc has enabled French steel to undercut German steel by 5 to 10 per cent in the Rhineland. No import duties exist on steel between member countries and quantitative restrictions are not possible. So the Germans want some substitute protection such as raising turnover taxes. Inside sources say they are fighting a losing battle. Even if some concessions are made, there will be a buyers' market in Europe for a long time to come, report German observers. French imports aren't heavy, but the pricing effects are fully there.

• **Coal Surplus**—Coal is presenting the biggest problem. There is a tremendous surplus. Over 25 million tons were in stock at the end of 1958. Inventories are still rising. Production is high. Imported coal is a minor irritant. Production quotas are being considered with action on imports.

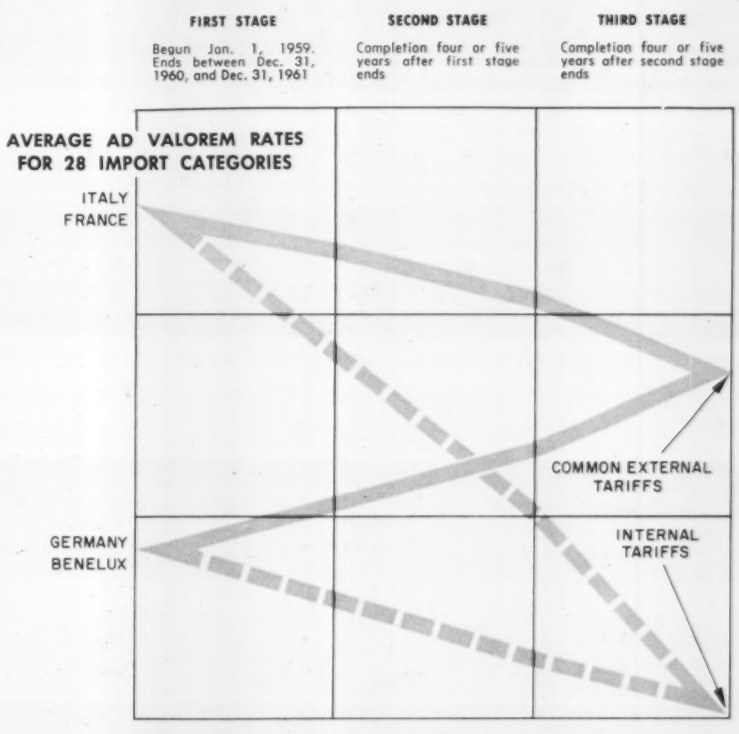
Managerial reorganization and closing of inefficient mines are being attempted. Result: Unemployment and labor troubles.

High coal costs are alienating consumers. Oil is growing increasingly competitive. The situation is similar to that faced in this country.

• **Business Good**—Despite all this, the over-all business picture is good. Domestic steel orders are on the increase due to lower consumer inventories and good employment in the steel industries. Exports continue to mount slowly.

Many Americans are buying plants. All branches of industry are involved. Some buyers say the Common Market tariff walls will be high, protecting mass production and efficient industries. Therefore, they see the necessity of establishing factories inside the market area.

Here's How Tariffs Will Change


FIRST STAGE
Begun Jan. 1, 1959. Ends between Dec. 31, 1960, and Dec. 31, 1961
SECOND STAGE
Completion four or five years after first stage ends
THIRD STAGE
Completion four or five years after second stage ends
AVERAGE AD VALOREM RATES FOR 28 IMPORT CATEGORIES
ITALY
FRANCE
GERMANY
BENELUX
COMMON EXTERNAL TARIFFS
INTERNAL TARIFFS

Source: European Community Information Service.

The Image of CF&I...
maker of CLAYMONT
STRUCTURAL STEEL PLATE FABRICATIONS

This Image—a giant steelman—reflects CF&I's experience as a top-ranking primary producer of quality steels as well as CF&I's versatility as a fabricator of steel plate structurals.

Examples of the CF&I-Claymont line of structural plate fabrications are: all-welded structural sections, bearing assemblies, base and tie plates, truss and strut footings, wedges, gussets and straps. Claymont's completely modern Fabrications Shop is equipped to turn out these fabrications in all shapes, sizes and gages, from carbon, alloy or stainless-clad plates.

Welded steel girders up to 160 feet in length and nine feet in depth at their pier ends, weighing some 40 tons each, were produced by Claymont's Fabrications Shop for bridges at Schuylerville, New York...to mention a recent example. Massive CF&I-Claymont welded steel plate sections were also supplied for the Mianus River Bridge crossing of the Connecticut Turnpike.

For complete information on CF&I-Claymont Structural Steel Plate Fabrications, contact the CF&I sales office nearest you.

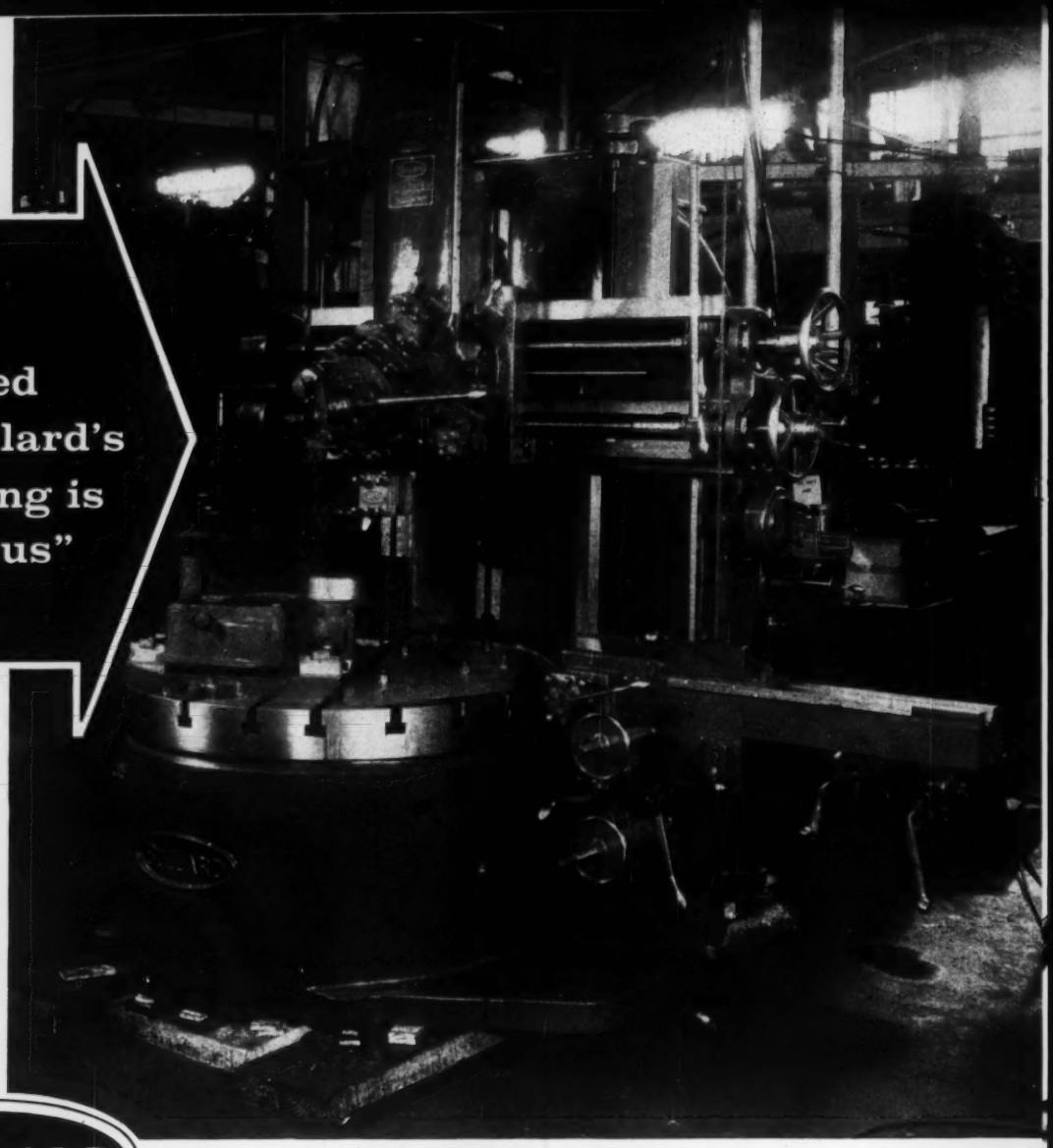
CF&I-CLAYMONT PRODUCTS: Carbon Steel Plates • Alloy Steel Plates • CF&I Lectro-Clad Nickel Plated Steel Plates • Clay-Loy High Strength Low Alloy Plates • Flanged and Dished Heads • Manhole Fittings and Covers • Fabricated Steel Plate Products • Large Diameter API Pipe

Claymont Steel Products

THE COLORADO FUEL AND IRON CORPORATION

In the West: **THE COLORADO FUEL AND IRON CORPORATION**—Albuquerque • Amarillo • Billings • Boise • Butte • Denver • El Paso • Ft. Worth • Houston • Kansas City Lincoln • Los Angeles • Oakland • Odessa • Oklahoma City • Phoenix • Portland (Ore.) • Pueblo • Salt Lake City • San Francisco • San Leandro • Seattle • Spokane • Tulsa • Wichita
In the East: **WICKWIRE SPENCER STEEL DIVISION**—Atlanta • Boston • Buffalo • Chicago • Detroit • New Orleans • New York • Philadelphia
CF&I OFFICE IN CANADA: Montreal • **CANADIAN REPRESENTATIVES AT:** Calgary • Edmonton • Vancouver • Winnipeg 6398

"We're convinced that Bullard's rebuilding is best for us"



BULLARD

54" Spiral Drive V.T.L. – similar to one rebuilt for Cann & Saul Steel Co.

About a year ago, the Cann & Saul Steel Company, Royersford, Pa., had The Bullard Company rebuild its 54" Spiral Drive V.T.L. Says Mr. Russell Freed, Vice President, "After Bullard disassembled the machine, I visited their plant to check on certain phases of the rebuilding and believe me when they say "Bullard rebuilds from the ground up" they mean exactly that — it was completely disassembled right down to the last bolt. We were so satisfied with their work on this machine that we since have had them rebuild our 42" Spiral Drive V.T.L. — in other words — one good job deserves another."

This same reliable rebuilding, guaranteed for one full year, both parts and labor, can be applied to your Bullard equipment. For information, just mail the coupon or write

THE BULLARD COMPANY
BRIDGEPORT 9, CONNECTICUT

THE BULLARD COMPANY 286 Canfield Avenue, Bridgeport 9, Conn.
Gentlemen: Please have your salesman call to discuss rebuilding our

_____

YOUR NAME _____ TITLE _____

COMPANY _____

CITY _____ ZONE _____ STATE _____

Auto Phenomenon: T-Bird . . .

Invades the Luxury Market

(1st quarter production)

	1959	1958	1957
Cadillac	46,117	39,052	42,648
Lincoln*	8,949	9,650	14,572
Imperial	6,069	4,637	12,180
Thunderbird	**18,461**	**7,644**	**5,356†**

*Includes Continentals.
†2 passenger models only.

AUTODOM has about decided Ford's Thunderbird is a definite contender in the luxury car market.

Ford calls it the "prestige" car. Some of Ford's competitors call it a "rich man's sports car." Regardless of name, the 'Bird now ranks ahead of Lincoln, Chrysler's Imperial and New Yorker, and Mercury's Park Lane in high priced car sales. Its first quarter sales are 16,500, equal to 45 per cent of 1958 T-Bird deliveries.

• **Motordom's Sleeper** — The fact that the Thunderbird qualifies for this market area is surprising because its price ($3696 to $3979) is in the upper medium bracket. But Ford sources say over 50 per cent of sales come from luxury lines as well as the upper medium group. What makes Ford marketing people even happier is that half of this year's sales are conquests from competitors. Most of the other half are former T-Bird owners or buyers who are "trading up" in the Ford family.

The four passenger Thunderbird replaced its two passenger predecessor just a year ago last January. It wasn't a sports car. Neither did it qualify as a luxury sized automobile. But like the sports roadsters of the late 1920s and early 1930s, the 'Bird has found a niche among those buyers who can afford prestige cars. Ford should sell about 50,000 Thunderbirds in 1959. That's equal to the total three year sales of the two passenger job.

• **Rumors**—Naturally, this kind of success breeds rumors. A popular one: The company will phase out Lincoln and substitute a slightly larger T-Bird. That doesn't make much sense to motordom because it would leave Ford with nothing to put up against Cadillac and Imperial in the same size.

It is possible, however, that the 'Bird may be given to Lincoln as a special series to replace the Continental which reportedly is not doing as well as the company hoped. Such a move would form part of a corporate marketing scheme that would upgrade the Ford line as its light car moves in at the bottom. A smaller Edsel could appear as a medium priced sports car and Mercury would continue to bracket the medium priced market. If such a move is decided upon, it won't be made before 1962.

• **Fill Gap** — Meanwhile, Ford is thankful for the Thunderbird because it's taking up some of the sales slack suffered by Lincoln, the only Ford line to show a loss for the first quarter. Lincoln sold only 8254 cars in the first three months. That is a 7.5 per cent drop from last year, although M-E-L Div. says mid-March sales were 20 per cent higher than the same period a year ago. It indicates a spring sales resurgence, claims M-E-L. It also gives Lincoln an edge over Chrysler's Imperial line, which sold an estimated 5600 cars in the first quarter against 4300 a year ago.

Lincoln and Imperial still have a long way to go before they're within shooting distance of Cadillac, which racked up its best first quarter in the division's 57 year history. James M. Roche, Cadillac's general manager, reports 39,491 cars were delivered in 1959's first three months to domestic markets.

Detroit now considers Lincoln, Imperial, and Cadillac its true luxury cars. List prices start at $5000 and these cars traditionally account for 5 per cent of the total

(Material in this department is protected by copyright, and its use in any form without permission is prohibited.)

market. So far this year, they haven't quite made the grade. Market penetration is around 4.1 per cent.

• **Questionable** — Other cars sometimes considered in the luxury class are Chrysler's New Yorker and Mercury's Park Lane. Their prices start at $600 to $800 less than the top lines; they're actually in another price classification. Buick's Electra 225 is in this group, too, although it doesn't replace the more expensive Limited series discontinued last year. Oldsmobile usually isn't counted although its 98 series competes pricewise.

The New Yorker historically pins down 30 per cent of the Chrysler line output. That puts its first quarter sales around 6100 units. Park Lane reportedly sold around 5400, and Electra 225 has accounted for an estimated 8000 deliveries. Add those to the top three and Thunderbird and you'll find the group has claimed 6.8 per cent of the January-March market.

• **Lineup**—Here's the rundown on first quarter domestic production:

	1959	1958
General Motors		
Cadillac	46,117	39,052
Buick	87,791	81,587
Oldsmobile	114,671	102,931
Pontiac	115,952	75,225
Chevrolet	441,939	393,868
Totals	806,470	692,663
Ford Motor Co.		
Ford	398,722	288,968
Edsel	13,734	4,060
Mercury	44,353	35,003
Lincoln	8,949	9,650
Totals	465,758	337,681
Chrysler Corp.		
Plymouth	95,683	100,981
Dodge	41,899	25,786
De Soto	15,418	10,876
Chrysler	18,728	15,370
Imperial	6,069	4,637
Totals	177,797	157,650
American Motors		
Ramblers	97,367	40,538
Studebaker-Packard		
Larks	48,831	8,214
Grand Totals	1,596,223	1,236,746

New Speed Control Offered

Clio Screw Products Co., Clio, Mich., has brought out a speed control device which it calls Travelez. It will sell for about $27, says Leslie M. Peters, Clio's president. Twenty years ago, this kind of unit would have been called a throttle regulator.

Travelez (Travel-Ease) is designed to hold the accelerator of your car at a given speed with a touch of the brake pedal or by pushing a shaft (throttle lever) mounted on the lower edge of a car's dash.

The dash lever may be adjusted so the car will return to a predetermined speed when it is reset.

The device is mechanically actuated and can be easily installed. Unlike the electronic speed control units offered by Chrysler and GM, this setup won't compensate for hill climbing. Mr. Peters says 10,000 units have been built and will be marketed through Peters-Kuperous Inc., Flint, Mich.

Ford Develops Gas Turbine

A 300 hp supercharged gas turbine engine has been developed by Ford Motor Co. The engine has been in the works for two and a half years. It's aimed at competing with diesel engines, so Detroit thinks that Ford plans to introduce it as a truck engine when GM brings out its turbine powered trucks.

Called the 704, Ford's turbine weighs 650 lb, against 2700 lb for a diesel powerplant of similar horsepower. The turbine is a two stage compression job. Fuel consumption equals that of a diesel rig and the engine will burn any fuel from kerosene to light diesel oil. It requires no warmup prior to operation.

The 704 is 38 in. long, 29 in. wide and 28 in. high. It would fit easily into the engine compartment of a '59 Ford with room to spare, says a Ford executive.

U. S. Auto Output

Passenger Only

	1959	1958
January	545,757	489,515
February	478,484	392,112
March	576,085	357,049
3 Mo. Totals	1,600,326	1,238,676
April		316,503
May		349,474
June		337,355
July		321,053
August		180,324
September		130,426
October		261,696
November		514,099
December		593,920
Total		4,243,526

Week Ended	1959	1958
Mar. 7	133,540	83,892
Mar. 14	134,283	86,447
Mar. 21	135,466	80,560
Mar. 28	121,832	93,844
Apr. 4	133,555†	64,318
Apr. 11	130,000*	84,997

Source: *Ward's Automotive Reports*. †Preliminary. *Estimated by STEEL.

GM-DuPont Ruling Nearer

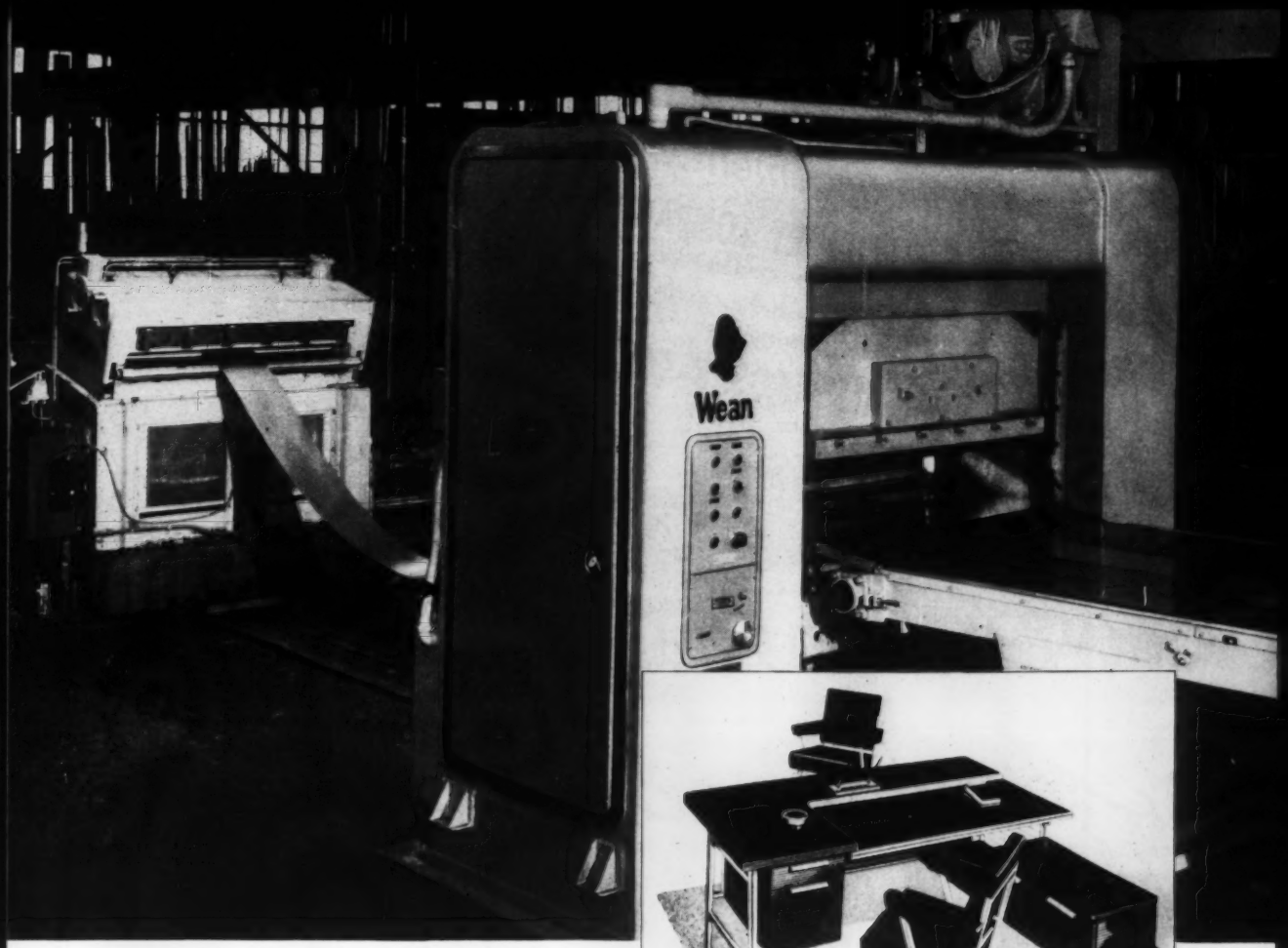
It looks like the government has collected most of its testimony in the antitrust proceedings it initiated against Du Pont and GM ten years ago. Final evidence from the last two months of hearings will be collected and is expected to be turned over to the U. S. District Court this month. Judge Walter J. Labuy of the Chicago District must reach a decision in keeping with the Supreme Court's ruling that the GM-DuPont relationship has "monopolistic tendencies."

Uncle Sam already has proposed that Du Pont sell 20 million of its GM shares on the open market over a ten year period. It also would distribute the remaining 43 million shares to Du Pont stockholders. Investors would receive 1.38 shares of GM stock for each share of Du Pont stock.

Du Pont contends that dumping such large blocks of stock on the market would have a depressing effect on the general economy—even over ten years. It has a $3 billion interest in the auto firm, and is expected to further appeal the district court's decision.

Exhaust Note

• Dow Chemical Co., Midland, Mich., has developed a rubber patch for concrete highways that needs to be only ½ in. thick instead of the 4 in. thick asphalt patches currently being used. It's made from a latex mortar and is being tested by the Michigan highway department.



At General Fireproofing Company...

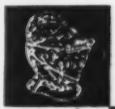
Material savings alone will pay for Wean coil processing lines in first year

This leading manufacturer of metal business furniture used to buy steel in various size sheets, re-square it and then stretcher-level about 80% of the sheets. Now a Wean slitting line and Wean FLYING PRESS combination shearing and blanking line (including a built-in leveler) make it possible for GF to purchase about 90% of their steel requirements in the more economical coil form. Maintaining a large sheet inventory is no longer necessary and costly re-processing operations have been eliminated entirely.

Based on figures covering the first six months these Wean coil processing lines have been in operation, GF expects material savings in the first year alone will exceed the cost of the equipment. Company officials estimate even greater savings when peak performance of the equipment is realized and when the FLYING PRESS is utilized for simultaneous shearing-blanking operations at a future date.

If you use sheet or strip steel in quantity, it's likely Wean coil processing equipment can reduce your material production costs.

We'll be happy to send you descriptive literature; or, if you prefer, one of our sales engineers will be glad to give you full information.



WEAN EQUIPMENT CORPORATION
CLEVELAND 17, OHIO
Detroit • Chicago • Newark

WEAN

A Natural

on Greenlee Air-Feed Automatics

Feed Out Stock to 16½"

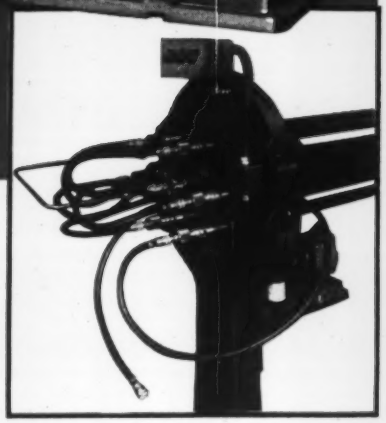
Eliminate Pushers and Feed-Out Cams

Greenlee Air-Feed Automatics offer you a 3-way profit advantage:

1. Maintenance and change-over time is reduced by eliminating stock pushers, feed tubes and feed-out cams.
2. Stock can be automatically air-fed to position in one or more machining stations permitting two or more pieces per cycle.
3. Multiple feed-out flexibility enables you to finish machine a variety of pieces that ordinarily demand costly second operation setups.

If you are running into production headaches on a specific job, Greenlee may be able to adapt an "Air-Feed" to solve your problem. See your Greenlee Distributor.

Write for your copy of Catalog A-405 — first step on the way to more profitable production with Greenlee Automatic Bar Machines.



Removable fittings attach air lines to the stock reel tubes. A vacuum pump withdraws the piston when restocking. Push-button control panel is provided for starting and stopping.

• • •

Greenlee Standard and Special Machine Tools

Multiple-Spindle Drilling and Tapping Machines

Transfer-Type Processing Machines

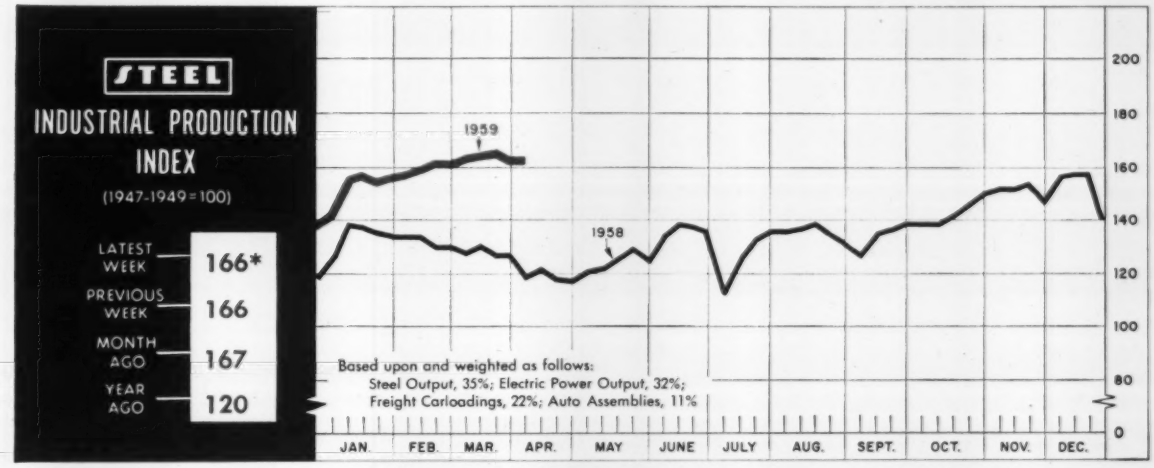
Six and Four-Spindle Automatic Bar Machines

Hydro-Borer Precision Boring Machines

Die Casting Machines

GREENLEE
BROS. & CO.

1741 MASON AVE.
ROCKFORD, ILL.



*Week ended Apr. 4.

Economy Regains Prerecession Peak

THE NATION'S ECONOMY has completed the circle. Nearly all the major business indicators show that the ground lost during the recession has been regained and that we're heading into new territory.

In some respects, this has been the most spectacular of the three postwar business cycles. It reached its previous peak last month, just 19 months after the downtrend set in. This is slower by one month than the 1948-49 recession but several months faster than the 1953-54 cycle.

Considering the fact that last year's slump was the deepest of the three, the recovery went at a much faster clip. It is doubtful that the uptrend will continue at anywhere near its initial rate, but most indications are that it will follow the general upward pattern of the earlier recoveries.

• **GNP at Record**—The broadest of all indicators, gross national product, has been breaking records for two quarters. The seasonally adjusted annual rate during the first quarter hit close to $465 billion. It will go higher in the current quarter, slow down during the next period before it reaches a rate close to $480 billion in the fourth quarter.

GNP regained its prerecession peak only two quarters after it hit the bottom, compared with four quarters in 1953-54 and two in 1948-49.

The Guaranty Trust Co. of New York cites three reasons for assuming that GNP will continue its upward movement: 1. Personal income continues to mount, suggesting a higher level of consumer buying. 2. Government surveys show that there will be an increase in plant and equipment spending during this quarter. 3. Inventories will continue to grow, not only because of the steel strike threat but also because of "more normal type of inventory building."

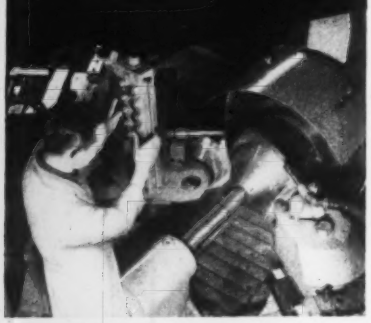
The bank also points out that

BAROMETERS OF BUSINESS

	LATEST PERIOD*	PRIOR WEEK	YEAR AGO
INDUSTRY			
Steel Ingot Production (1,000 net tons)[2]	2,638[1]	2,638	1,308
Electric Power Distributed (million kw-hr)	12,400[1]	12,709	11,326
Bituminous Coal Output (1,000 tons)	7,820[1]	7,695	7,451
Crude Oil Production (daily avg—1,000 bbl)	7,150[1]	7,193	6,250
Construction Volume (*ENR*—millions)	$338.3	$355.4	$598.5
Auto, Truck Output, U. S., Canada (*Ward's*)	169,246[1]	155,171	87,870
TRADE			
Freight Carloadings (1,000 Cars)	585[1]	604	516
Business Failures (Dun & Bradstreet)	297	292	327
Currency in Circulation (millions)[3]	$31,225	$31,231	$30,636
Dept. Store Sales (changes from year ago)[3]	+16%	+17%	+2%
FINANCE			
Bank Clearings (Dun & Bradstreet, millions)	$21,882	$24,865	$20,382
Federal Gross Debt (billions)	$282.0	$282.4	$272.6
Bond Volume, NYSE (millions)	$32.0	$22.8	$18.7
Stocks Sales, NYSE (thousands of shares)	15,642	12,876	8,638
Loans and Investments (billions)[4]	$93.6	$94.7	$89.8
U. S. Govt. Obligations Held (billions)[4]	$29.4	$30.3	$28.1
PRICES			
STEEL's Finished Steel Price Index[5]	247.82	247.82	239.15
STEEL's Nonferrous Metal Price Index[6]	220.3	220.8	195.9
All Commodities[7]	119.5	119.3	119.6
Commodities Other than Farm & Foods[7]	127.9	127.8	125.9

*Dates on request. [1]Preliminary. [2]Weekly capacities, net tons: 1959, 2,831,486; 1958, 2,699,173. [3]Federal Reserve Board. [4]Member banks, Federal Reserve System. [5]1935-39=100. [6]1936-39=100. [7]Bureau of Labor Statistics Index, 1947-49=100.

let Ingersoll HYDROSPIN your parts



If the shape of your part is tubular, conical, hemispherical, or curvilinear, hydrospinning by the Ingersoll Kalamazoo Division may save you costly machining expense and time. If you want a seamless part, try hydrospinning. If you want precise wall thickness, turn to hydrospinning. Hydrospinning saves on metal, time and labor.

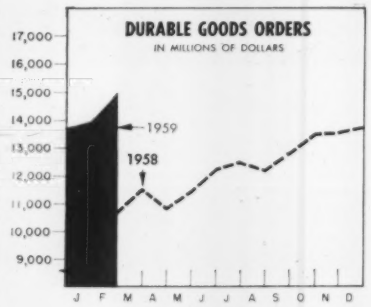
COMPLETE PRODUCTION FACILITIES

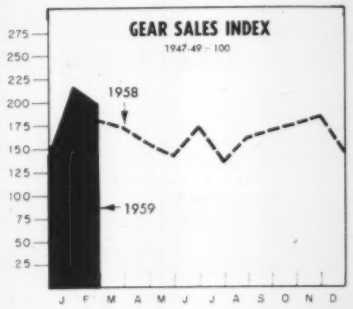
Ingersoll Kalamazoo Division has an experienced engineering staff, and complete hydrospinning equipment. If you have a metal forming problem where hydrospinning may be of help to you, send an outline of your problem or contact the Defense Sales Dept. of

Borg-Warner Corporation

ENGINEERING
B-W INGERSOLL KALAMAZOO DIVISION
PRODUCTION
1810 N. Pitcher St. • Kalamazoo, Michigan

THE BUSINESS TREND





	New Orders* 1959	New Orders* 1958	Sales* 1959	Sales* 1958
Jan.	13,900†	10,704	13,500†	12,646
Feb.	14,900†	10,688	13,800†	12,038
Mar.	.....	11,488	.....	11,670
Apr.	.....	10,833	.....	11,532
May	.....	11,423	.....	11,643
June	.....	12,245	.....	12,086
July	.....	12,512	.....	12,256
Aug.	.....	12,177	.....	12,385
Sept.	.....	12,859	.....	12,723
Oct.	.....	13,530	.....	12,943
Nov.	.....	13,574	.....	13,295
Dec.	.....	13,673	.....	13,613

*Seasonally adjusted. †Preliminary.
U. S. Office of Business Economics.
Charts copyright, 1959, STEEL.

	1959	1958	1957	1956
Jan.	218.6	174.5	259.3	245.5
Feb.	199.9	179.1	239.5	256.2
Mar.	....	173.7	262.4	276.5
Apr.	....	153.2	221.7	264.7
May	....	142.2	263.2	275.6
June	....	173.8	215.9	245.4
July	....	133.3	211.4	286.7
Aug.	....	162.1	225.8	219.5
Sept.	....	170.7	174.9	230.5
Oct.	....	175.9	207.0	299.8
Nov.	....	182.7	165.3	216.2
Dec.	....	145.5	150.8	235.7
Avg	....	163.9	216.4	254.4

American Gear Mfrs. Assn.

"the recovery movement has not produced any demonstrable distortions or excesses in the economy. And so long as this is true, there will be prospects for continuing gains, since in a healthy environment each new phase of expansion —accompanied as it is by a higher flow of payments—tends to beget still more expansion."

• **Production Gains** — March also marked the complete recovery of industrial production. The Federal Reserve Board's industrial production index in February rested just 1 point under the prerecession peak of 145 (1947-49=100), and there is little doubt but what it moved up at least 1 point in March. STEEL's production trend line (Page 73) indicates that the FRB index may have matched the all-time high of 146 set in December, 1956.

It took production 11 months to rise from its trough. This compares with ten months for the other two recoveries. If the pattern holds, the rise will continue haltingly through the second quarter.

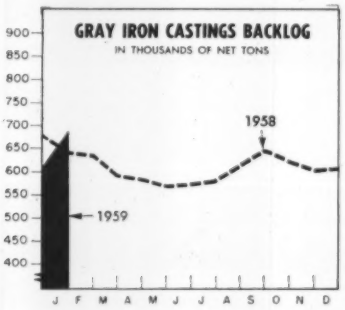
What happens after that will depend on the outcome of the steel wage negotiations. But the fourth quarter should be the best of the year in any case.

• **Orders Near Record** — A good part of the optimism in business today is traceable to the rapid rise in new orders for manufactured goods. At $29.8 billion in February (seasonally adjusted), they were the highest since November, 1956. The rate of recovery in this case was considerably faster than in either 1950 or 1955.

The record for new orders ($31.1 billion in August, 1956, following the steel strike) could easily fall before the second quarter is over.

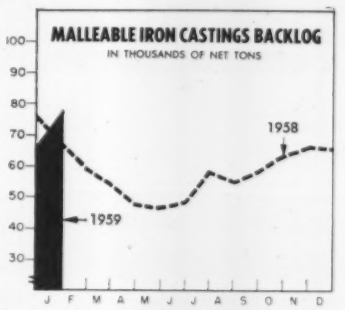
The $1.3 billion jump from January to February was accounted for largely by the biggest increase in durable goods orders in many months. (See table and graph, above.) The comeback of the steel and auto industries had some bearing here, but it should be remembered that they did not show their greatest strength until March. Conclusion: The improvement was across the board in durable goods.

Manufacturing sales (the government's term for production) naturally lagged new orders. But even so, at $28.5 billion they are the highest since mid-1957 and on a par with most months in 1956. Again, most of the improvement was accounted for by the durable goods sector.



	Shipments		Unfilled Orders*	
	1959	1958	1959	1958
Jan.	1,002	868	687	638
Feb.	....	....	753	... 632
Mar.	....	....	796	... 590
Apr.	....	....	807	... 582
May	....	....	820	... 570
June	....	....	868	... 573
July	....	....	792	... 580
Aug.	....	....	802	... 614
Sept.	....	....	917	... 645
Oct.	....	....	993	... 620
Nov.	....	....	958	... 602
Dec.	....	....	998	... 608
Total	....	....	10,372	

*For sale. U. S. Bureau of the Census.



	Shipments		Unfilled Orders*	
	1959	1958	1959	1958
Jan.	73.2	62.7	77.3	67.3
Feb.	....	54.7	...	59.0
Mar.	....	51.7	...	54.3
Apr.	....	50.7	...	47.7
May	....	48.3	...	46.6
June	....	51.9	...	48.3
July	....	41.9	...	58.3
Aug.	....	49.3	...	55.1
Sept.	....	56.8	...	58.4
Oct.	....	61.0	...	63.4
Nov.	....	63.4	...	66.7
Dec.	....	68.4	...	65.9
Total	....	660.8		

*For sale. U. S. Bureau of the Census.

• **But Employment Lags** — The most important indicator still trailing the general upturn is employment. But even here, there is reason to believe that the future is brighter. Unemployment declined 387,000 to a total of 4,362,000. This is 836,000 below the year-ago figure and well below all but the latter months of 1958 when seasonal factors reduced unemployment. Total employment rose 1,006,000 to 63,828,000, which is 1,157,000 above the March, 1958, figure. Total employment now is only slightly below the corresponding 1957 level.

But even this feature of the recovery is in keeping with historical patterns. In the 1950 recovery, total employment did not regain the prerecession peak until eight months after production fully recovered. Following the 1953-54 slump, the lag was longer—17 months. Because of the increase in the labor force, the improvement in unemployment took even longer.

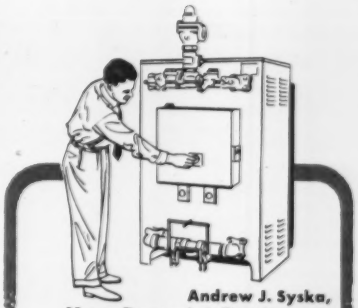
Sees Capital Spending Up

Spending for capital improvements could be the most pleasant surprise of the second half of 1959, says the Guaranty Trust Co. of New York. Taken at face value, the bank admits that latest government figures indicate a leveling off after the anticipated rise during the current quarter. "There would seem to be a serious question, however, as to whether the survey findings should be taken at face value," its economists contend.

"Certainly in the past it has been typical for cyclical recovery in investment spending, once underway, to continue so long as the general economic situation is healthy. It should not be forgotten, moreover, that comparable survey findings in 1955 forecast a substantially lower level of investment spending for the second half of that year than actually occurred, or that comparable data in 1950 forecast a decline in the second half spending instead of the considerable rise which occurred."

The bank concludes: "There may be a good deal more strength in plant and equipment spending in the second half of this year than is indicated by the survey data."

The third quarter could see a moderate rise in GNP. But a fourth quarter rise could be brisk if there should be a conjunction of rising capital expenditures, a rebound from a steel strike, and the introduction of U. S. economy cars.



Andrew J. Syska,
Hayes Research & Development Engineer Reports . . .

KNOW-HOW IS VITAL IN GAS AND LIQUID DRYING

When we developed the Molecu-Dryer®—a unit specially designed to take advantage of the remarkable drying, sweetening, and purifying capabilities of Linde Company's Molecular Sieves—our chief interest was in drying protective atmospheres (hydrogen, dissociated ammonia, etc.) for metallurgical work—to dewpoints well below –100°F. A natural outgrowth of the Molecu-Dryer was the *Nitro-Gen*®—an automatic cycling generator which produces low cost, high purity nitrogen for blanketing, purging, protecting. Our engineering people have also explored whole new worlds of gas, liquid, and atmosphere drying and separating problems.

NEW DRYING NEEDS APPEAR DAILY

In manufacturing transistors, for example, the Molecu-Dryer has been able to effect big economies by supplying moisture-free air in place of tank nitrogen to protect transistor assembling and sealing operations. Other current projects: instrument air drying, gaseous CO_2 drying, gas separating . . . also drying and separating of liquid or gaseous hydrocarbons.

EQUIPMENT DESIGN IS DYNAMIC!

Each new area of work has necessitated engineered application of standard or special Molecu-Dryer models, to provide optimum adsorption efficiency, top capacity at minimum equipment cost, job-coordinated cycle times, and fast desorption and cooling.

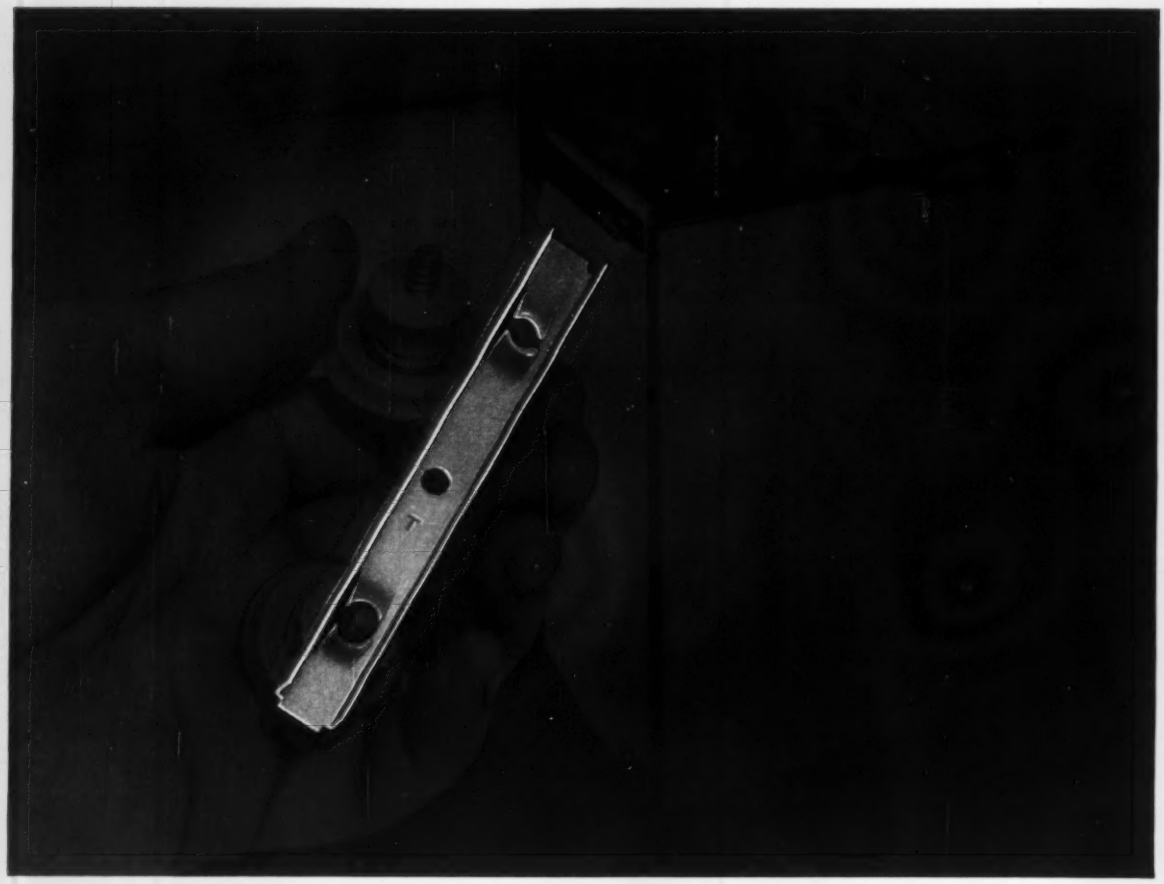
For a comprehensive picture of the Molecu-Dryer, write for Bulletin 5703.

*Hayes TM

C. I. HAYES, INC.
839 Wellington Avenue • Cranston 10, R. I.
Established 1905

ELECTRIC FURNACES

It pays to see HAYES for metallurgical guidance, laboratory facilities, furnaces, atmosphere generators, gas/fluid dryers.



Engineered by Tinnerman...

Savings pyramided 68% by a switch to TINNERMAN SPEED NUTS®

First, the saving in material on the General Electric Dishwasher . . . a Tinnerman SPEED NUT brand fastener is formed right in a channel stamped from high-carbon spring steel. This replaces a costly solid steel bar formerly used to mount the pull-out basket rollers.

Next, the Tinnerman SPEED NUT impressions are stamped right in the channel; expensive boring and tapping of the bar stock are eliminated.

Third, sheet metal screws hold tight in the SPEED NUT, and are easier to start and drive than the machine screws formerly used.

General Electric's dishwasher production goes faster and assembly costs are reduced by the easy-to-apply feature of the simplified SPEED NUT part. The difference in weight even makes an important reduction in freight costs on each carload shipment of dishwashers.

What Tinnerman SPEED NUTS accomplished for General Electric can probably be done for you.

A call to your Tinnerman Sales Representative will be the start. He's in the Yellow Pages under "Fasteners".

Or write to:

TINNERMAN PRODUCTS, INC.
Dept. 12 • P. O. Box 6688 • Cleveland 1, Ohio

TINNERMAN
Speed Nuts®

FASTEST THING IN FASTENINGS®

CANADA: Dominion Fasteners Ltd., Hamilton, Ontario. GREAT BRITAIN: Simmonds Aerocessories Ltd., Treforest, Wales. FRANCE: Simmonds S. A., 3 rue Salomon de Rothschild, Suresnes (Seine). GERMANY: Mecano-Bundy GmbH, Heidelberg.

G. K. VIALL
Chain Belt senior v. p.

ADOLPH A. KARRASCH
Hercules dir.-manufacturing

GALEN MILLER
Towmotor exec. v. p.

JOHN L. MOLNER
National Acme v. p.

G. K. Viall was appointed senior vice president, **Chain Belt Co.**, Milwaukee. He was vice president. Mr. Viall joined the company in 1921 and has previously served as chief engineer of the Chain Div., assistant to the president, and works manager.

Adolph A. Karrasch was appointed director of manufacturing, **Hercules Motors Corp.**, Canton, Ohio. For the last year, he was assistant works manager of International Harvester Co.'s motor truck plant at Ft. Wayne, Ind., and had served with IHC for 22 years.

Robert V. Merrell was named general sales manager, **Atkins Saw Div.**, Indianapolis, Borg-Warner Corp. He succeeds **C. J. Meister**, resigned. Mr. Merrell was eastern division manager, and assistant general sales manager.

William H. Jackson was elected vice president-sales, **Diamond Power Specialty Corp.**, Lancaster, Ohio. He was assistant marketing manager, Boiler Div., Babcock & Wilcox Co.

American Steel & Wire Div., Cleveland, U. S. Steel Corp., created two new executive sales positions. Promoted to manager of distribution and availability is **M. E. Capouch. William H. Guterl** was promoted to manager of marketing.

Charles W. Wesson was elected president, **Eastern Machine Screw Corp.**, New Haven, Conn. He succeeds **Carl W. Bettcher**, now chairman.

Galen Miller, former vice president and treasurer, was elected executive vice president, **Towmotor Corp.**, Cleveland. **Harold E. Boehm** was made treasurer, and is succeeded as controller by **Dave Quere. Richard S. Wentz**, recently made factory manager, was elected a vice president. **Lee Cirillo** was made director of new product research.

Mark W. Cresap Jr., since Jan. 1, 1958, president of **Westinghouse Electric Corp.**, and chief administrative and operating officer, was elected to greater executive responsibilities as president and chief executive officer. He assumes duties of **Gwilym A. Price**, who continues as chairman, and remains active in an advisory and consulting capacity, particularly in industrial affairs. Mr. Price will devote considerable time to affairs of the University of Pittsburgh, as newly elected president of its board of trustees.

William W. McQuilkin was elected president, **Bausch & Lomb Optical Co.**, Rochester, N. Y. Former executive vice president, he succeeds **Carl S. Hallauer**, now chairman. **Carl L. Bausch**, former chairman, has retired.

Southern Pipe Div., Azusa, Calif., U. S. Industries Inc., appointed **Archie Maither** general superintendent to succeed **George Gansner**, retired. Mr. Maither was plant superintendent. **Gordon Graham** was named plant manager, a new post, and for the present continues as chief engineer. **John A. Ellis**, sales manager, was promoted to a new post of director of marketing.

John L. Molner, chief engineer, was elected a vice president of **National Acme Co.**, Cleveland, to succeed **A. E. Drissner**, retired. **Robert W. Gillespie**, former assistant treasurer, was advanced to secretary. **E. L. Barnard** becomes assistant treasurer.

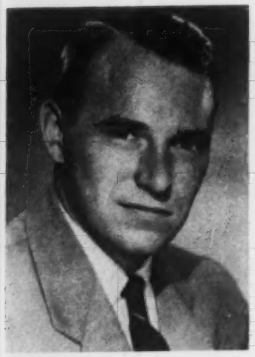
Arnold N. Hellewell was made sales director for turret drilling machines at **Brown & Sharpe Mfg. Co.**, Providence, R. I. This line of machines was recently acquired through the company's purchase of Howe & Fant Inc., East Norwalk, Conn. Mr. Hellewell, associated with the company's Machine Tool Div., was formerly in the Ohio territory.

John C. Wallace was elected president, **Walworth Co.**, New York. He was vice president-general manager. **Harold Brown** was made vice president and general sales manager. **Fred W. Belz**, former president, was elected chairman.

Walter H. Schefft, former factory manager, was made assistant general manager, Stamping Div., **Eaton Mfg. Co.**, Cleveland.

G. Luther Parsons was made manager of **Perfect Circle Corp.'s** main plant in Hagerstown, Ind.

William H. Dwyer Jr. was appointed manager of Mid-Continent and Gulf Coast sales for **Graver Tank & Mfg. Co.**, division of Union Tank Car Co., East Chicago, Ind. Former Gulf Coast sales manager, he continues headquarters in Houston. **E. G. Vail** was promoted to plant manager at Sand Springs, Okla., and **Charles P. MacDonald** was



RICHARD C. BRYAN

A. C. SCHLIEWEN

White Motor Co. appointments

HENRY GERLACH

JOSEPH A. FRISZ

Minneapolis-Moline positions

made assistant product manager of that plant (oil and gas equipment).

Richard C. Bryan was named manager of manufacturing; **A. C. Schliewen,** works manager of **White Motor Co.,** Cleveland. Both are newly created positions. Mr. Bryan is in charge of detailed manufacturing, including purchasing, quality control, material control, truck and machining divisions. Mr. Schliewen is responsible for machining and truck assembly.

John J. Hayes was elected president, **Morse Twist Drill & Machine Co.,** New Bedford, Mass., a division of Van Norman Industries Inc. Former executive vice president and general manager, he succeeds **Charles F. Myers,** who assumed the presidency of Van Norman.

Henry A. Roemer Jr., formerly president of Sharon Steel Corp., joined **Pittsburgh Metallurgical Co. Inc.** as manager of the Cleveland district office.

Henry Gerlach was elected vice president and general manager, **Minneapolis-Moline of Canada Ltd.,** Regina, Sask. **Joseph A. Frisz** was named export manager of Minneapolis-Moline Co., Hopkins, Minn., parent firm, to succeed **Philip W. Mortimer,** retired. Mr. Gerlach went to Indianapolis in 1956 to help set up a new division there. He moved to Harrisburg, Pa., a year later to organize a Minneapolis-Moline division for the Eastern Seaboard. Mr. Frisz was formerly with U. S. Rubber International.

W. J. Lawler was made product sales manager for rod, bar, and wire products for **Kaiser Aluminum & Chemical Sales Inc.,** Chicago.

Paul R. Gravenstreter was named district engineer for the new Detroit district office of **Clark Controller Co.**

Sheldon K. Howard was appointed manager, Diesel Div., **Fairbanks, Morse & Co.,** Chicago, to succeed **Carroll E. Dietle,** resigned. Mr. Howard was manager, Diesel Dept., Atlanta **branch.**

William E. Chamberlain Jr., assistant group executive of **American Machine & Foundry Co.'s** Atomic Energy Group, was appointed a divisional vice president. He is in New York. Mr. Chamberlain is also general manager of AMF Atomics Div., and serves as general manager, Industrial Reactor Laboratories Inc., a co-operative industrial nuclear research center owned by ten industrial firms.

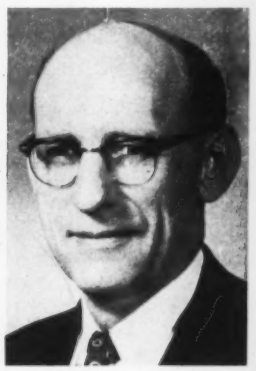
George E. Austin was made Spokane, Wash., district manager for **Link-Belt Co.,** to succeed **Homer A. Garland,** who for reasons of health has relinquished these duties, and continues as supervisor of the Spokane factory branch store.

Roy K. Kreabber, former manufacturing manager at the Lynch Road Gear & Axle plant of Chrysler Corp., was appointed plant manager of the company's **Amplex Div.** He is in charge of manufacturing

HENRY A. ROEMER Jr.
joins Pittsburgh Metallurgical

JOHN J. HAYES
Morse Twist Drill pres.

SHELDON K. HOWARD
Fairbanks, Morse div. mgr.



ROY K. KRAEBBER
Amplex plant manager

JUST OUT! 52-page book . . .

with exciting color illustrations and design details

Here's a book that offers new design ideas, new uses for stainless steel in building. "Architecture and Allegheny Stainless" brings you up-to-date on the latest professional developments . . . with full-color illustrations of buildings just completed or still under construction.

Specific data, with pictures and design details, illustrate such stainless applications as curtain wall construction, store fronts and entrances, windows, hardware, roofing and others.

Evidence enough that modern architecture's demands are more than matched by the strength, quiet beauty and corrosion-resistance of Allegheny Stainless.

"Architecture and Allegheny Stainless" is filled with facts vital to everyone concerned with architecture and buildings. Write today for your free copy. *Allegheny Ludlum Steel Corporation, Oliver Building, Pittsburgh 22, Pa.*
Address Dept. S-16

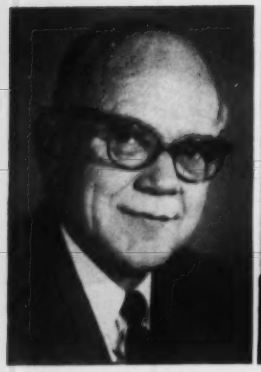
WSW-7813

ALLEGHENY LUDLUM

for warehouse delivery of Allegheny Stainless, call RYERSON

Export distribution: AIRCO INTERNATIONAL

EVERY FORM OF STAINLESS . . . EVERY HELP IN USING IT



E. C. SCOVILLE
McKee purchasing dir.

G. C. VERKERK
joins Caloric Appliance

E. R. HUMANN
Air Reduction purchasing dir.

M. EARL SAXMAN
Vulcan Mold plant mgr.

RALPH E. PRICE
Landis Tool exec. v. p.

HAROLD F. SCHULTE
Wheelabrator chief eng.

operations at Amplex plants in Detroit and Trenton, Mich.

M. Earl Saxman was named plant manager, Chicago district plant at Lansing, Ill., **Vulcan Mold & Iron Co.** **Arthur Moynihan** was made foundry superintendent at Lansing, and **Jack I. Countreman** personnel manager there. Mr. Saxman was foundry superintendent.

Ralph E. Price was elected executive vice president and assistant general manager, **Landis Tool Co.**, Waynesboro, Pa. He was general manager of the subsidiary, Gardner Machine Co., Beloit, Wis., and most recently vice president of Landis. **Eugene R. Fogt**, former controller, was elected assistant treasurer. **Daniel H. Ruth** was named promotion and advertising manager; **William P. Flohr**, chief engineer.

E. C. Bullard, chairman, Bullard Co., Bridgeport, Conn., relinquished his duties as chief executive officer to **E. P. Bullard III**, president. Mr. Bullard continues as chairman.

Harold F. Schulte was appointed chief engineer of **Wheelabrator Corp.**, Mishawaka, Ind. He joined Wheelabrator in 1940, and for the last year has been acting chief engineer.

James P. Haight, vice president-engineering and purchasing, **Aluminum Co. of America**, Pittsburgh, has retired. Engineering and purchasing functions will be continued by **B. J. Fletcher**, vice president-general manager of engineering; and **R. O. Keefer**, vice president-general purchasing agent.

Lyle E. Baker was appointed assistant general sales manager, **Trent Tube Co.**, East Troy, Wis., subsidiary of Crucible Steel Co. of America.

Aubrey W. Jewell, vice president-manufacturing, Hussmann Refrigerator Co. Ltd., Brantford, Ont., subsidiary of **Hussmann Refrigerator Co.**, St. Louis, was appointed to general manager of the organization's New Jersey plant, near Haddonfield.

E. C. Scoville was made director of purchases, **Arthur G. McKee & Co.**, Cleveland. He succeeds **T. W. Rutledge**, retired. Mr. Scoville became purchasing agent in 1947, and acting director of purchases last December.

G. C. Verkerk joins **Caloric Appliance Corp.**, Topton, Pa., May 1 as a division manager. He will head the metal preparation and porcelain enamel departments. Previously, he was with the research and development divisions of O. Hommel Co., Pittsburgh, and Ferrow Corp. in Leiden, Holland.

E. R. Humann was appointed director of purchases, **Air Reduction Co. Inc.**, New York. He is succeeded as president of Airco Co. International (export division) by **J. G. Bell**, former sales manager of the division.

Fluor Corp. Ltd., Los Angeles, appointed **James P. Kneubuhl** vice president-utility sales; **George H. Dieter**, vice president-foreign sales; **David S. Tappan**, vice president-domestic sales.

Curtis W. Burr was made Milwaukee district sales manager, **Inland Steel Co.**, to succeed **Peter M. Lorenz**, retired. **Robert O'Dea** succeeds Mr. Burr as assistant manager.

Lawrence G. Felder was named president of **Virginia Metal Products Corp.**, Orange, Va. He succeeds **Fred I. Courtney.**

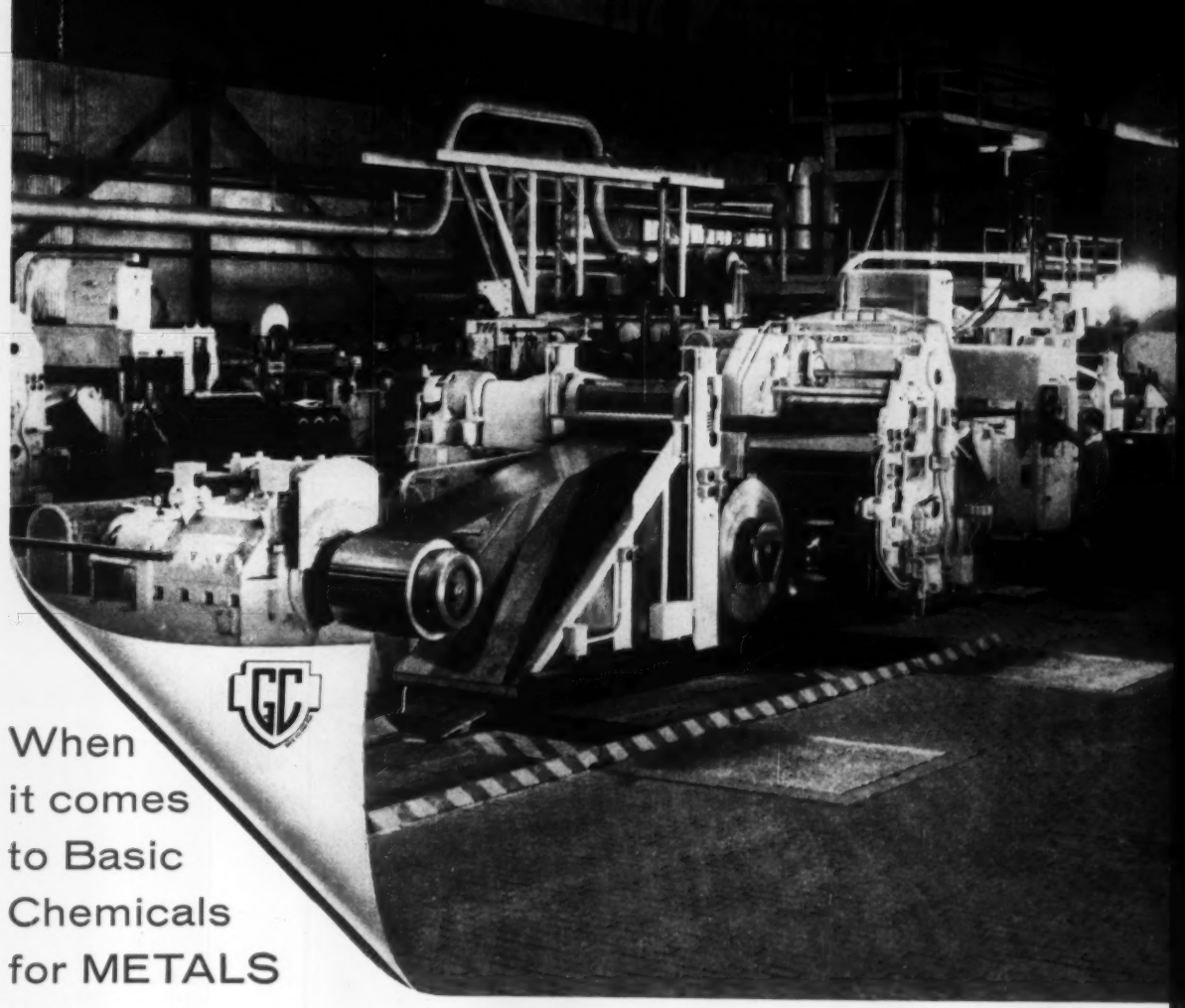
Frank H. Patterson Jr. was appointed assistant to the sales manager, Cargotainer Div., **Tri-State Engineering Co.**, Washington, Pa. He was assistant to the manager of material handling sales, Pittsburgh Steel Co.

P. J. Deery was appointed manager of sales and quality control at **Sorensen & Co.**, South Norwalk, Conn.

OBITUARIES...

Henry W. Foulds, 68, who retired in January as chairman of **Pfaudler Permutit Inc.**, Rochester, N. Y., died Apr. 4 in Bronxville, N. Y.

Charles B. Johnson, 55, head purchasing agent, **Chain Belt Co.**, Milwaukee, died Mar. 30.



When it comes to Basic Chemicals for METALS

...come to General Chemical!

There are good basic reasons for making General Chemical your source of supply for basic chemicals. Our large-scale production is one. Long experience is another. And there are many more—including consistent high quality and uniformity of product... top-notch technical service... a coast-to-coast network of plants and distribution points... plus efficient follow-through from order to delivery and beyond that to satisfactory performance. That's why—when it comes to basic chemicals—it's wise to come to General Chemical for all these products....

- Sulfuric Acid
- Hydrochloric (Muriatic) Acid
- Nitric Acid
- Hydrofluoric Acid
- Sodium Fluoride
- Sodium Bifluoride
- Trisodium Phosphate
- Sodium Metasilicate
- Sodium Silicate
- Oxalic Acid
- Fluoboric Acid
- Potassium Fluoborate
- Sodium Fluoborate
- Ammonium Fluoborate
- Lead Fluoborate
- Tin Fluoborate
- Copper Fluoborate
- Iron Fluoborate
- Nickel Fluoborate
- Cadmium Fluoborate

Baker & Adamson® Laboratory Reagents

Basic to America's Progress

Allied Chemical

GENERAL CHEMICAL DIVISION
40 Rector Street, New York 6, N. Y.

Aircraft Components Manufacturer Specifies

OSTUCO *Forged Tubing*

FOR LOWER MACHINING COSTS

Forging tube end in Shelby mill. In addition, Ohio Seamless can supply tubing flared, swaged, expanded, upset, flanged, shaped, etc.

"Our machining time on this landing gear part in SAE 4140 plummeted from *400 to 180 minutes* when we changed from forgings to Ostuco Forged Tubing.

"In addition to getting *over 80% more parts per workshift*, we like the free-machining qualities of Ostuco tubing that give us extra savings in set-up time and tool grinding costs . . ."

These actual figures, from an eastern manufacturer, indicate the machining economies Ostuco Forged Tubing can effect in your product. The starting point is to call your nearest Ohio Seamless office, listed in the Yellow Pages, or the plant at *Shelby, Ohio — Birthplace of the Seamless Steel Tube Industry in America.*

AA-8860

Be sure to visit Booth 205
Design Engineering Show
May 25-28, Philadelphia

OSTUCO SHELBY OHIO — OSTUCO TUBING

OHIO SEAMLESS TUBE DIVISION

of Copperweld Steel Company • SHELBY, OHIO

Seamless and Electric Resistance Welded Steel Tubing • Fabricating and Forging

SALES OFFICES: Birmingham, Charlotte, Chicago (Oak Park), Cleveland, Dayton, Denver, Detroit (Huntington Woods), Houston, Los Angeles (Lynwood), Moline, New Orleans (Chalmette), New York, North Kansas City, Philadelphia (Wynnewood), Pittsburgh, Rochester, St. Louis, St. Paul, St. Petersburgh, Salt Lake City, Seattle, Tulsa, Wichita CANADA: Railway & Power Engr. Corp., Ltd. EXPORT: Copperweld Steel International Company, 225 Broadway, New York 7, New York

Inland Replacing Outmoded Rerolling Mill Equipment

INLAND STEEL CO. is boosting the capacity of its rail rerolling mill at Chicago Heights, Ill., 75 per cent —from 80,000 to 140,000 tons a year.

The extensive modernization and rehabilitation program is scheduled for completion in 1960. It includes: Installation of a new reheating furnace, modernization of the rolling mills with the addition of new rolling stands and motors, enlargement of the rolling mill and other buildings to accommodate additional equipment, improvements in finishing facilities, expansion of the electrical power and distribution systems, installation of a recirculatory water system, and replacement of other outmoded equipment and processes.

"These changes will enable the plant to go from a two to three shift daily operation," says John F. Smith Jr., president. With the present equipment, a third shift spends its time changing rolls for the following day's operations.

• **Greater Versatility**—In periods of high demand, the modernized mill will supplement the capacity of Inland's merchant mills at Indiana Harbor, Ind., by processing billets produced there into a variety of merchant bar products.

The reheating furnace scheduled for replacement was Inland's first furnace, installed when the company was founded in 1893. It was Inland's sole operation until 1902 when the firm built its first open hearth furnace at Indiana Harbor. Originally steam powered, the plant was electrified in 1927 and two rolling stands were added in 1929.

The new furnace will provide faster and more uniform heating than the original. That will enable the plant to get the additional heating capacity required by its 75 per cent over-all boost in output.

"The modernization program will result in the most comprehensive changes ever made at this plant," Mr. Smith says. "Although it has been one of Inland's most satisfactory operations, the plant must now be rehabilitated to increase the company's long range competitive advantage in the rail steel business."

Inland's Chicago Heights Works converts used railroad rails and steel billets into a variety of products. These include concrete reinforcing bars, fence posts, bulbed tees, sub purlins, angles, automobile bumper brackets, and jacks.

Buys Wire Forming Unit

Acme Stamping & Mfg. Co., Pittsburgh, acquired the wire forming facilities of Townsend Co., New Brighton, Pa. All equipment, tools, dies, and drawings have been transferred from New Brighton to Pittsburgh.

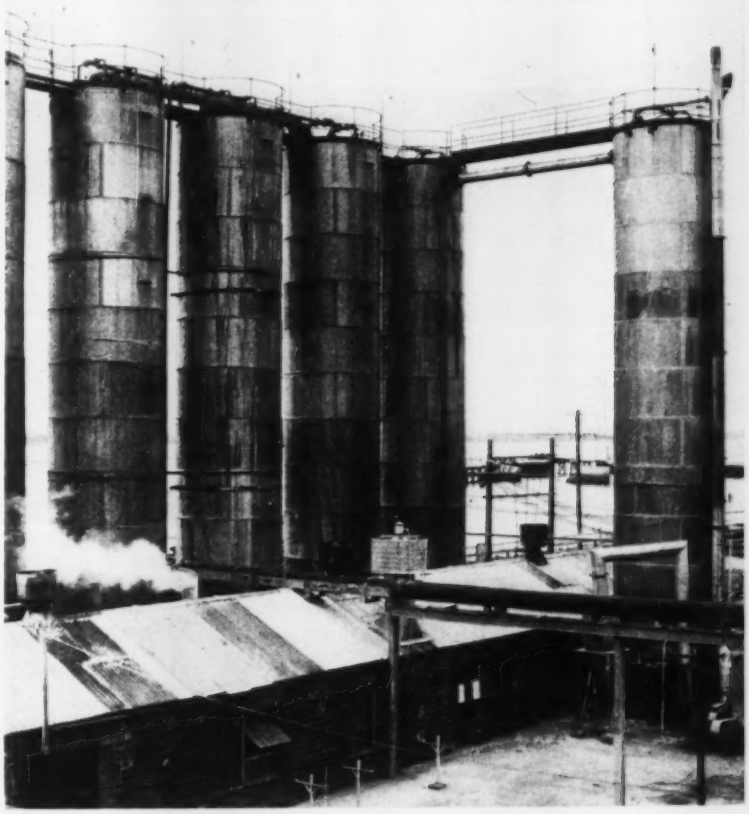
Offers Titanium Pumps

Duriron Co., Dayton, Ohio, is manufacturing centrifugal pumps and valves of commercially pure titanium. The firm's engineers worked with Mallory-Sharon Metals Corp., Niles, Ohio, on welding and fabrication techniques required to produce these new items.

Tappan Co. Expanding

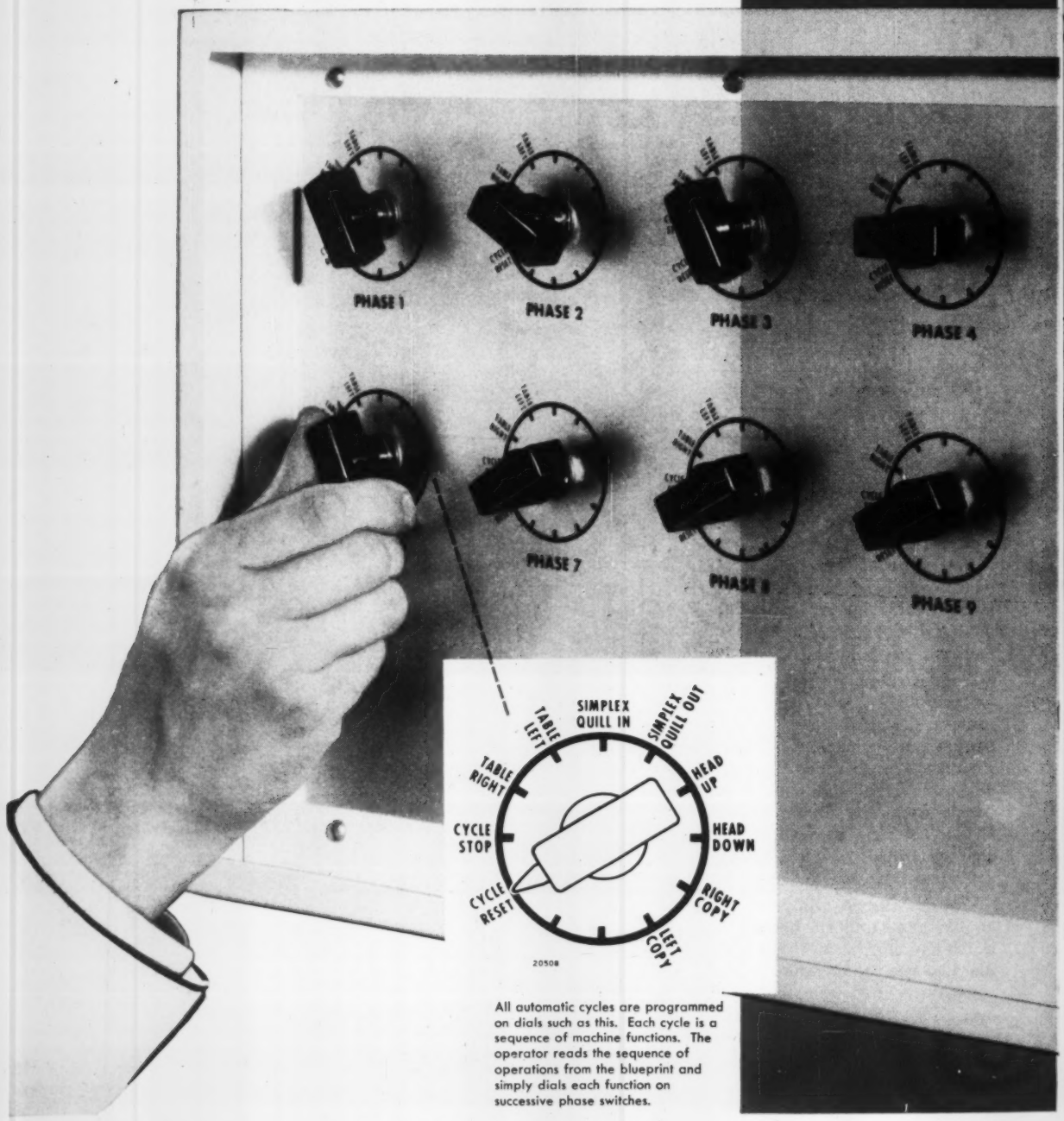
Tappan Co., Mansfield, Ohio, has launched a two year, $3.7 million expansion program. Production capacity of the Mansfield plant will

(*Please turn to Page* 86)



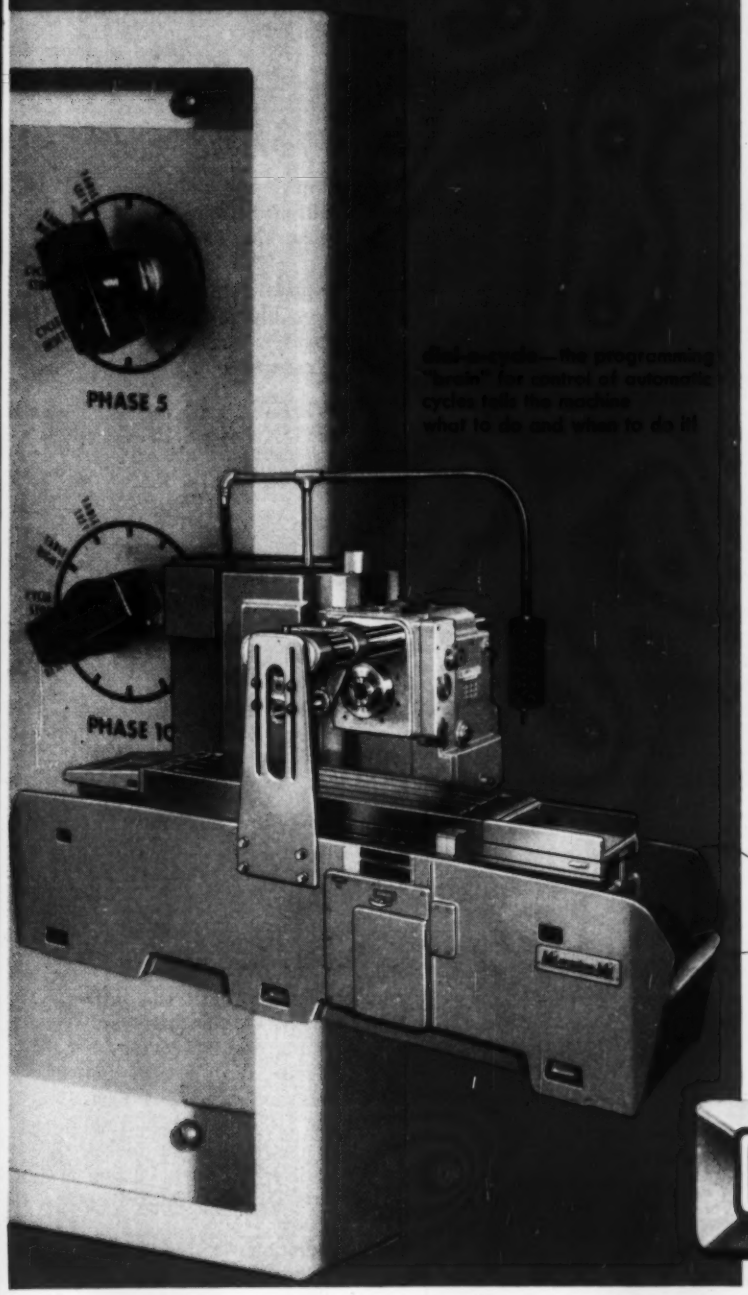
THESE STAINLESS STEEL TOWERS (52 ft high and 10 ft in diameter) have been in use since 1926 at a major chemical plant. Installed for nitric acid production, they've been handling sodium nitrite since 1948. They were fabricated from 3/8 and 5/16 in. Republic Steel Type AA (430) Enduro. The shell sections are fastened with 3/4 in. rivets

Tune in on new ***"programmed production"*** *savings with*



All automatic cycles are programmed on dials such as this. Each cycle is a sequence of machine functions. The operator reads the sequence of operations from the blueprint and simply dials each function on successive phase switches.

Mil·waukee·Mil



THE FULLY AUTOMATIC BED-TYPE MILLING MACHINE WITH *EXCLUSIVE* DIAL-A-CYCLE

All you do is dial automatic cycles to slash idle cutter time!

Here's a remarkable machine that cuts out operator guesswork! He merely reads a workpiece blueprint and establishes machining sequence with successive phase-switch dials.

From there on in, dial-a-cycle programs and controls each and every machine function — automatically.

Result — the machine is earning its keep practically every minute . . . is seldom idle while the operator stops to figure out his next move. You get more finished pieces in less time . . . faster write-off on machine cost.

For details on any of the 72 standard models (Simplex and Duplex) 7½ to 30 hp, write for bulletin MM-58.

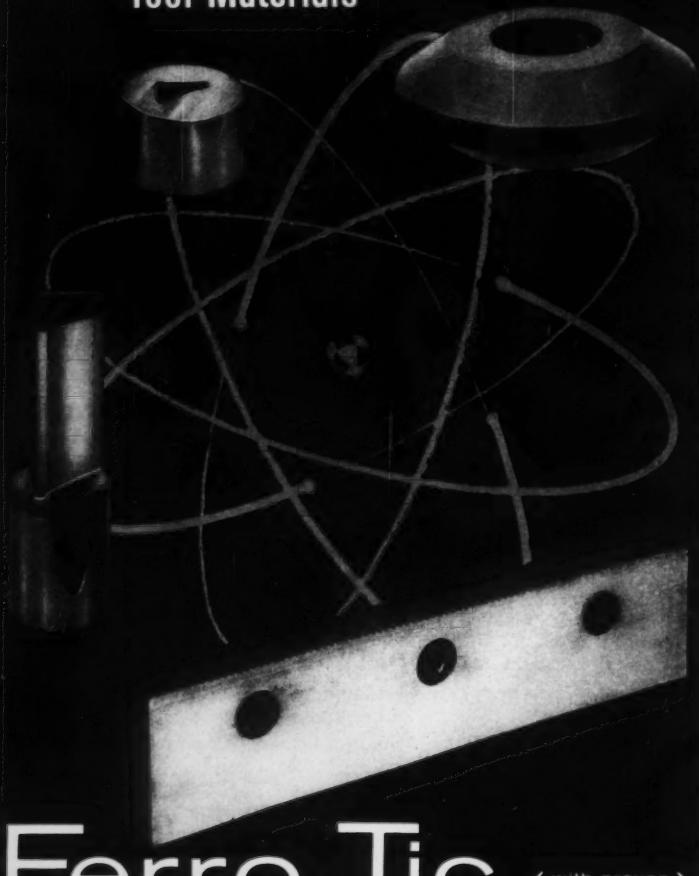
Standard Machine Division
KEARNEY & TRECKER CORP.
6790 West National Ave., Milwaukee 14, Wis.

Available on Tool-Lease!

Designers and Builders of Precision and Production Machine Tools Since 1898

KEARNEY & TRECKER MILWAUKEE ®

A completely new concept in Tool Materials



Ferro-Tic (with proven performance)

the only machinable carbide in existence!

FOR: Blanking, Laminating, Deep Drawing and Heading Dies, Arbors, Core Rods, Wear Parts, etc.

FERRO-TIC combines the fabricating advantages of steel with the wear-resistance of carbide. In the annealed, completely dense state, FERRO-TIC can be machined with high-speed steel tools on conventional tool room equipment; thus, the need for costly diamond grinding is eliminated. Once hardened, by oil quenching from 1750°F, FERRO-TIC is extremely hard and wear-resistant. FERRO-TIC stock blanks can be fabricated into long-wearing carbide components, using available tools and skills without delay!

AGENTS THROUGHOUT THE U.S.A.

Write or telephone for complete information:

FERRO-TIC can be
- TURNED
- DRILLED
- MILLED
- SAWED
- TAPPED

SINTERCAST
CORPORATION OF AMERICA
136 Woodworth Avenue, Yonkers 2, N.Y. YOnkers 9-6767

(*Concluded from Page 83*)

be increased 30 per cent through construction of a building to house a steel coil and shear line. An enameling plant will be added and other changes will be made at its Murray, Ky., property. Its capacity will be increased 50 per cent.

Vulcan To Build in South

Vulcan Metal Products Inc., manufacturer of aluminum products for the home building field, will build a $300,000 plant in the Irondale Industrial Park near Birmingham. The 50,000 sq ft plant is expected to go into operation in mid-1960.

Madison To Move Plant

Key personnel and plant equipment of Madison-Faessler Tool Co. will move about May 1 from Moberly, Mo., to the Providence, R. I., home of the parent company, Madison Industries Inc. The Moberly plant produces burnishing equipment and recessing tools.

Forms Distributorship

Metal Sales Inc. will distribute metals from a new plant on Union Pacific Avenue, East Los Angeles, Calif. The new firm acquired the complete metal inventory and leased the metal warehouse facilities of Union Hardware & Metal Co. Richard F. Morgan is president.

Enters Machinery Field

Northeast Ohio Machine Builders Inc. has been organized at Columbiana, Ohio, to design and build machinery and equipment for steel and forest product industries. W. K. Stamets Jr. is president and general manager.

SPS Boosts Capacity

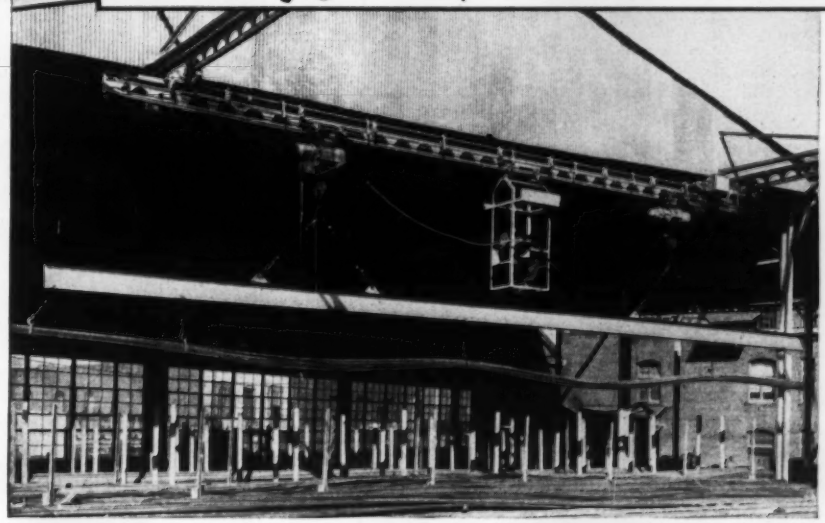
Standard Pressed Steel Co., Jenkintown, Pa., has a new high temperature plating facility which increases its capacity to finish hot spot fasteners and structural parts fivefold. The $100,000 unit will apply diffused nickel-cadmium, nickel, copper, and silver coatings of a type used on parts for temperatures up to 1400° F.

The installation was made because of the greatly stepped up de-

Unloading bundles of rod with a Cleveland Tramrail transfer crane arranged for push-button floor control. This crane may be interlocked with the track system serving various sections of the shop, enabling the load being delivered directly to point of use with the Tramrail hoist carrier without need of any in-between handling.

Rod Forming Plant Cuts Production Time 50%

Reduces Costs Tremendously with Cleveland Tramrail System



Here the same crane is shown with an operator's cab and second hoist carrier. The hoists support a lifting beam which will handle bundles of rod up to 60'-0" long. Note the runway extensions that permit spotting the crane directly over a gondola car.

"THERE is no comparison between a shop equipped with Cleveland Tramrail handling equipment and one using hand methods," said an executive of the Southern GF Co., Atlanta, Georgia.

He should know, because this prominent company has cut production costs in half in the cutting and forming of steel rod for concrete work. Savings are made with the tramrail starting with unloading of incoming steel and through the various steps of manufacture. For instance, only 10 man-hours are now required to unload a railroad car as compared to 45 formerly required.

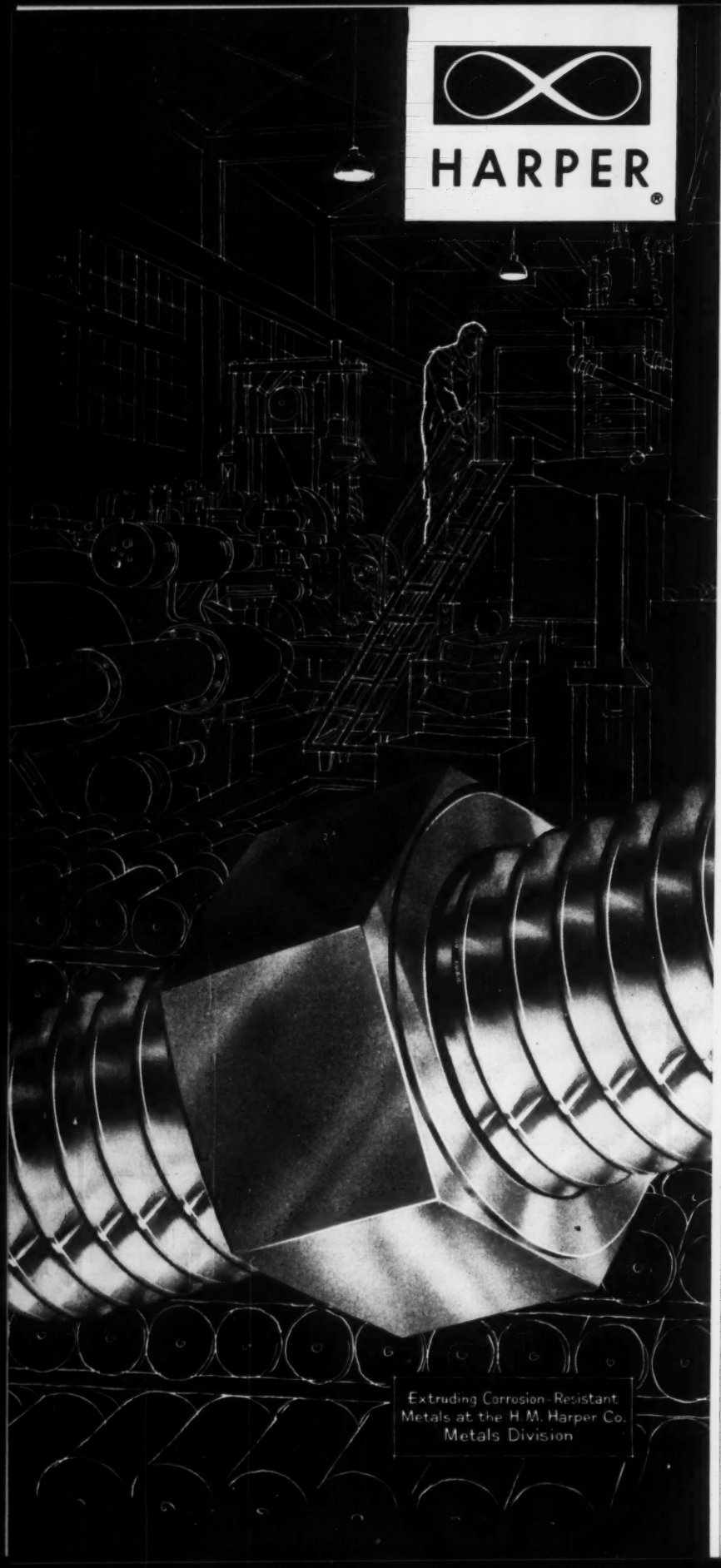
The Cleveland Tramrail at Southern GF has been designed to provide the utmost in flexibility of handling. It consists of transfer cranes and a track and switch system. The crane used for car unloading can be arranged for floor control or cab control. The latter arrangement is used when 60-foot long bundles of rod are handled by two widely spaced hoists, the cab being located at the center of the bridge.

Write for free Engineering and Application Booklet No. 2008. Packed with valuable information.

CLEVELAND TRAMRAIL

Overhead Materials Handling Equipment

CLEVELAND TRAMRAIL DIVISION • THE CLEVELAND CRANE & ENGINEERING CO. • 7823 E. 290th ST. • WICKLIFFE, OHIO



mands from the aircraft and missile industries for the higher-heat bolts, including a 200 per cent jump within the year in orders for the relatively low cost nickel-cadmium plated fasteners, reports SPS.

Electronics Firm Expands

Babcock Radio Engineering Inc., Costa Mesa, Calif., has built a 25,000 sq ft plant addition. The firm makes guidance control equipment for missile target aircraft, transmitters, coding and decoding systems, and a variety of test equipment used throughout the electronics and missile industries.

To Make Walworth Fittings

Midwest Piping Co. Inc., St. Louis, has completed negotiations with Walworth Co., New York, for manufacture of Walworth welding fittings, including elbows, reducers, tees, caps, and laterals. John Wallace, president of Walworth, says: "Midwest welding fittings complement our present lines of cast and malleable fittings and will be sold nationally through Walworth offices and distributors."

Revere Forms Mining Dept.

Revere Copper & Brass Inc., New York, has established a Mining Dept. with John J. Collins as general manager, to develop ore sources, including bauxite.

Gearmaker Building Plant

Philadelphia Gear Corp., Philadelphia, is constructing a plant at King of Prussia, Pa. The 180,000 sq ft building will be completed late this year and is scheduled to be in full operation by early 1960. The firm makes gearing, speed reducers, fluid mixers, and valve controls.

Forms Machinery Firm

Colt Packaging Machinery Co., a newly formed company at Cranston, R. I., purchased the assets of the Box Machinery & Equipment Div. of Colt's Plastics Co. Inc., Hartford, Conn. The new firm will handle sales and service and has assigned manufacture of the machinery to Henry Owens & Co., Cranston.

Philco Plans Expansion

Philco Corp., Philadelphia, contemplates capital expenditures through 1961 of about $21 million for: Additional plant and equipment for the manufacture of transistors by its subsidiary, Lansdale Tube Co.; for the manufacture by the company of electronic computers; and for equipment for a new research center.

Dosco Opens Axle Plant

Dominion Steel & Coal Corp. Ltd., Montreal, Que., has placed in operation at Trenton, N. S., new facilities for the production of railway car axles. The $250,000 installation includes an axle billet reheating furnace, a hot billet mechanical conveyor, a hot axle conveyor, a 400-ton hot axle straightener, and a saw-off and centering machine. The reheating furnace has a rated capacity of about 300 tons a day.

LFM Builds Big Foundry

LFM Mfg. Co., Atchison, Kans., has completed expansion of its electric steel foundry. New capacity is 3000 tons a month. Rebuilding all prior facilities cost $3 million. A 50 per cent expansion of area was carried out at the same time. Major products include diesel locomotive truck frames, large high-pressure valves, and structural components for heavy machinery. Castings range from 200 to 30,000 lb, net. The firm is a subsidiary of Rockwell Mfg. Co., Pittsburgh.

Marwais Steel Expands

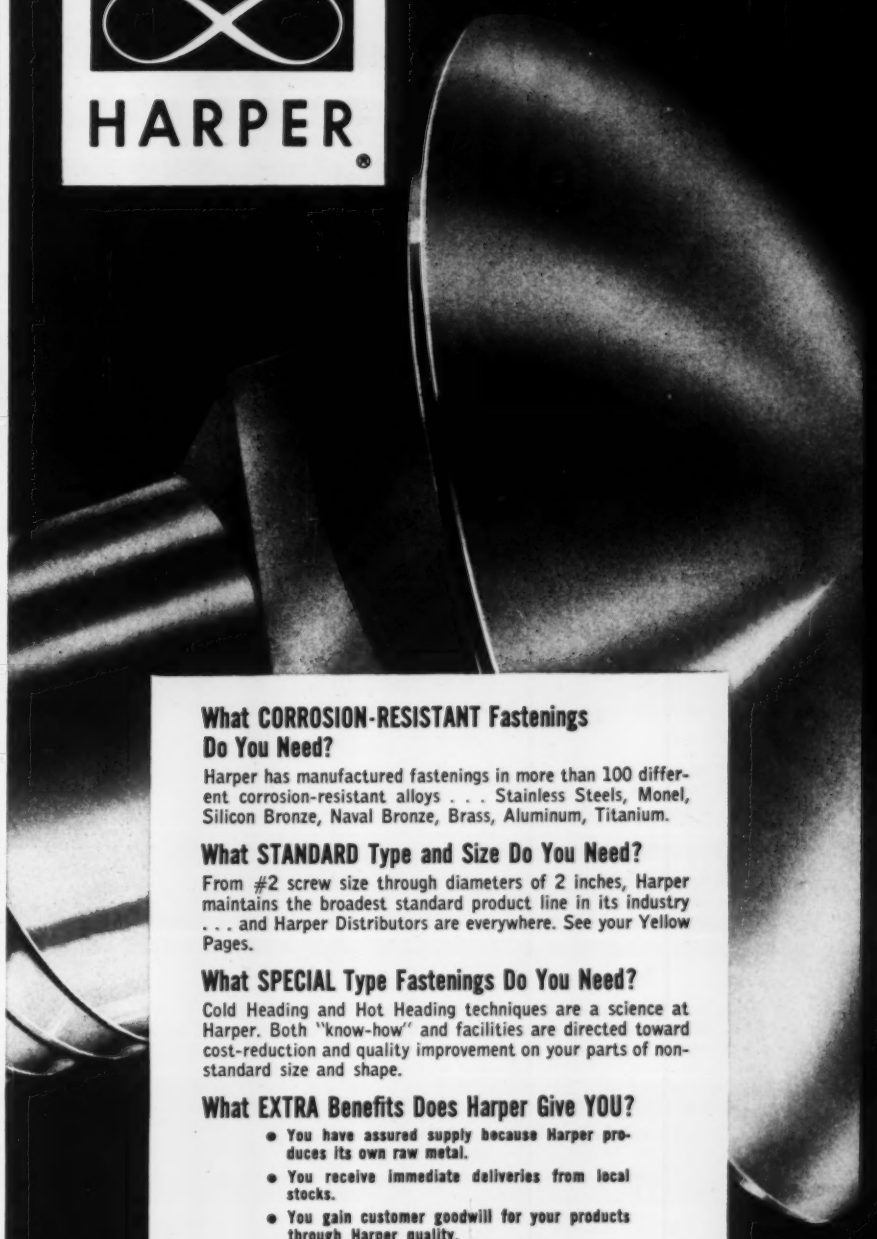
Marwais Steel Co. has added 30,500 sq ft of warehouse and administrative office space to its headquarters near Montebello, Calif. The firm makes metal plate guard rail for highway use and distributes sheet steel.

NEW PLANTS

Techline Div., Wheelabrator Corp., Vicksburg, Mich., has a new warehouse and processing laboratory facilities at 2602 E. Foothill Blvd., Pasadena, Calif. Stocks of wet blasting and barrel finishing

HARPER®

Corrosion-resistance starts here



What CORROSION-RESISTANT Fastenings Do You Need?

Harper has manufactured fastenings in more than 100 different corrosion-resistant alloys . . . Stainless Steels, Monel, Silicon Bronze, Naval Bronze, Brass, Aluminum, Titanium.

What STANDARD Type and Size Do You Need?

From #2 screw size through diameters of 2 inches, Harper maintains the broadest standard product line in its industry . . . and Harper Distributors are everywhere. See your Yellow Pages.

What SPECIAL Type Fastenings Do You Need?

Cold Heading and Hot Heading techniques are a science at Harper. Both "know-how" and facilities are directed toward cost-reduction and quality improvement on your parts of non-standard size and shape.

What EXTRA Benefits Does Harper Give YOU?

- You have assured supply because Harper produces its own raw metal.
- You receive immediate deliveries from local stocks.
- You gain customer goodwill for your products through Harper quality.
- You lower your costs by efficiencies in purchasing, maintenance and assembly.

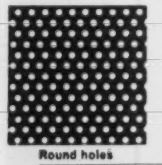
Discaloy bolts being removed from 1800° molten salt bath

THE H. M. HARPER COMPANY

8200 LEHIGH AVENUE • MORTON GROVE, ILLINOIS

LET H&K PERFORATED MATERIALS

put personality into your products

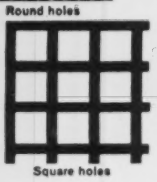


Round holes

Whenever—wherever—your products require perforated materials, you will find the pattern and open area "just right" for that custom-look in the vast selection of H & K existing dies.

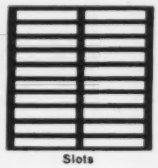
Modern facilities and H & K experienced craftsmanship, enable the perforating of practically all metals, wood, compositions and plastic. Perforated materials can be furnished in sheets, coils, rolls or plates. Fabricating services include shearing, rolling, welding and forming.

Illustrations shown in reduced size

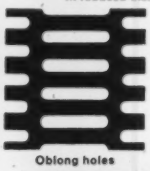


Square holes

Herringbones



Slots



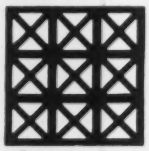
Oblong holes

Functional or Decorative Uses

H & K fills every need for perforated materials. Appropriate perforated metals can be ordered with color anodized, brushed and lacquered, painted, chrome plated, baked-on, or other special finishes.

Many patterns in steel sheets (industrial or decorative) are in stock at our warehouses. Send for H & K Stock List Brochure.

Write for General Catalog No. 75, Today!



Decorative patterns

THE Harrington & King PERFORATING CO. INC.

Chicago Office and Warehouse • *New York Office and Warehouse*

5627 Fillmore Street, Chicago 44, Illinois • 118 Liberty Street, New York, New York

Listed Under "Perforated Metals"

Punches & Dies

Since 1903

Made to highest standard and uniform quality thus insuring maximum service.

In Stock

Round, Square, Oblong Punches and Dies, Rivet Sets

Write Dept. A for catalog 60 and new stock list

GEO. F. MARCHANT COMPANY

1420-34 So. ROCKWELL STREET • CHICAGO 8, ILLINOIS

equipment, parts, and supplies will be carried.

Logo Div., Bee Chemical Co., Chicago, acquired new quarters at 17000 S. Western Ave., Gardena, Calif., for warehousing the firm's coatings and metallizing finishes.

Security Valve Corp., Glendale, Calif., is building an 11,000 sq ft office and plant facility in South Pasadena, Calif. The firm makes automatic control equipment for the missile, aircraft, petroleum, and natural gas industries.

CONSOLIDATIONS

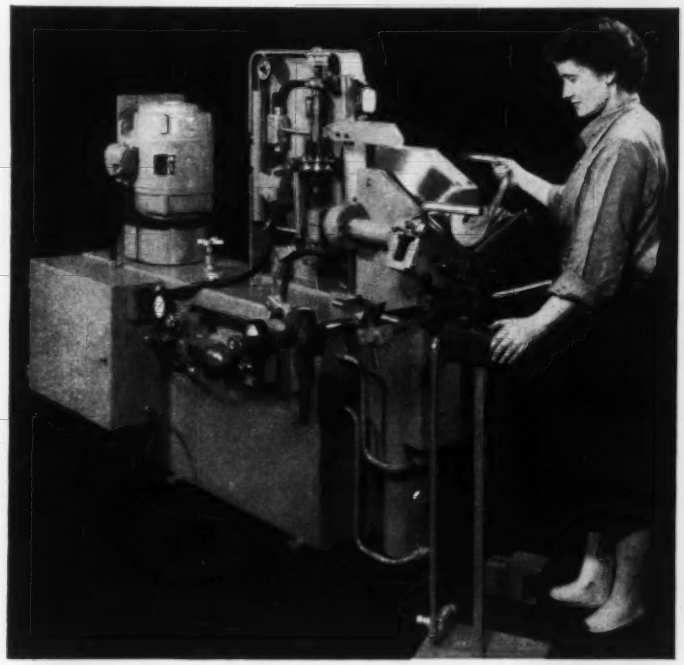
Textron Inc., Providence, R. I., acquired all the assets of **Townsend Co.**, New Brighton, Pa., and will operate the property as a wholly owned subsidiary. Townsend makes rivets, fasteners, and special cold formed parts. It is moving all New Brighton production facilities to its new plant at Ellwood City, Pa. Townsend also has plants in five other locations in this country and a Canadian affiliate. The company has formed an Engineered Fasteners Div. which comprises the Ellwood City and expanded Chicago operations. The division is headed by R. E. Casner, vice president and general manager, with headquarters at Ellwood City. H. C. Kornman is assistant general manager of the new division. Sales and marketing activities will be headed by W. R. Wyckoff and R. E. Crowley. P. F. Barry is now sales manager of Townsend's Eastern Div.

R. C. Mahon Co., Detroit, acquired Walter G. Mitchell Industries, **Mitchell Steel Inc.**, and Mitchell Properties Inc., all of Torrance, Calif. Operations of the firms will be merged with those of Mahon in a new plant. Investment in the 200,000 sq ft plant and facilities: About $3.5 million. Mitchell's operations include the fabrication and erection of structural steel.

Maytag Co., Newton, Iowa, purchased a controlling interest in American Missile Products Co. Inc., Lawndale, Calif., manufacturer of electronic products.

NEW PINES 3T PRESS

Cuts Bending Costs AS MUCH AS 50%



COMPLETE LINE OF BENDING PRESSES

In addition to the Model 3-T, Pines also builds the larger bending presses, illustrated below, which are also establishing outstanding performance records.

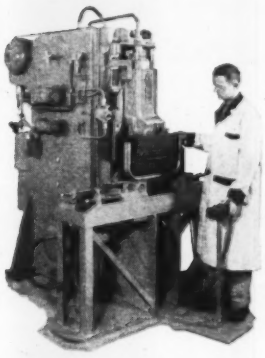
Makes Bends Progressively to Varied Angles In Multiple Planes 2 to 3 Times Faster

Quality bends at production speeds that are 2 to 3 times faster than conventional methods, are now possible with the new Pines 3-T Bending Press. Many tubular parts in sizes up to 1" O.D. are now formed at net speeds of over 1000 bends an hour. Up to 9 different bend angles can be produced in a single setup. Adjustable automatic indexing stops accurately control depth of ram stroke. Open tooling area permits rapid progressive bending in varied planes.

Wing Die Design Assures Quality Bends

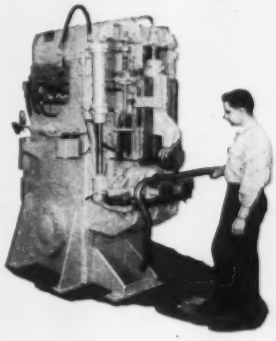
High production speed is just part of the story. Unusually smooth, good looking bends are produced to meet the quality demands of automotive, furniture, toy, office equipment, and appliance manufacturers. Wing dies of the press are designed to move in ways as a bend is made, and their pivoting action is hydraulically cushioned through bearing-mounted rocker arms. This principle eliminates scratches or draw marks and produces wrinkle-free bends with very little distortion. Get the complete story on cost cutting advantages of this new Bending Press today.

MODEL 6T FOR MULTIPLE U-FRAME BENDING



Makes two bends of the same or slightly different angles in each of two or more tubes simultaneously. Production of four or more bends with each stroke makes it possible to form 1700 to 3000 bends per hour in tube sizes ranging up to 1" O.D. x .065". When necessary, retractable ram dies are used to release pieces from die grooves. Like 3-T, wing dies move with work, eliminating draw marks, producing bends of superior quality.

MODEL 1900 FOR PROGRESSIVE BENDING OF TUBES UP TO 2" O.D.



Designed for high speed bending of parts requiring a variety of bends in different planes, such as automotive exhaust and tail-pipes, or similar work. Major features are automatic angle indexing and greater working clearance which permits completing, for example, 90% of all bends in a tail-pipe with a single tooling setup. Press handles stock sizes up to 2" O.D.

PINES ENGINEERING CO., INC.

Specialists in Tube Fabricating Machinery | 663 WALNUT • AURORA, ILLINOIS

WRITE FOR *FREE* DATA SHEETS

To keep abreast with bending, write for free copies of "Pines News"—get latest data on rotary and press-type machines, and up to date information on tooling.

PRODUCTION BENDING • DEBURRING • CHAMFERING MACHINERY

HIGHER BONDING STRENGTH

WITH KAISER BASIC BRICK FOR THE STEEL INDUSTRY

Exceptionally high strength at critical intermediate temperatures (1400°F to 1850°F) . . . that's the unique advantage you get with Kaiser unburned brick!

When the internal temperature of bricks in a furnace structure reaches the point where the chemical bond is destroyed, brick strength reaches its lowest point and cracking and spalling losses may result. In the chart, note the high crushing strength after firing in the intermediate range. This denotes strong bond at all temperatures — a unique feature of Kaiser unburned bricks.

The Difference: Solid State Reaction

With Kaiser brick, there is no "liquid phase" in the formation of the ceramic bond. Kaiser's use of volatized silica (particles as fine as cigarette smoke) promotes a **solid state reaction** at lower temperatures which starts to form the ceramic bond **before** the chemical bond burns out. Result: **higher** bonding strength, **higher** resistance to thermal shock and mechanical abuse in furnace charging.

Solid state reaction also gives Kaiser brick outstanding resistance to distortion and shrinkage. Excellent resistance to chemical attack by furnace fumes, iron oxides and slags is assured by high MgO content, maximum brick density and chemically stable composition.

Make your own comparison tests and see how much more performance you get with Kaiser Basic Brick. And ask to see the new 30-minute color movie "Progress In Modern Basic Refractories." Your Kaiser Chemicals Sales Engineer or Regional Office will be glad to make the arrangements.

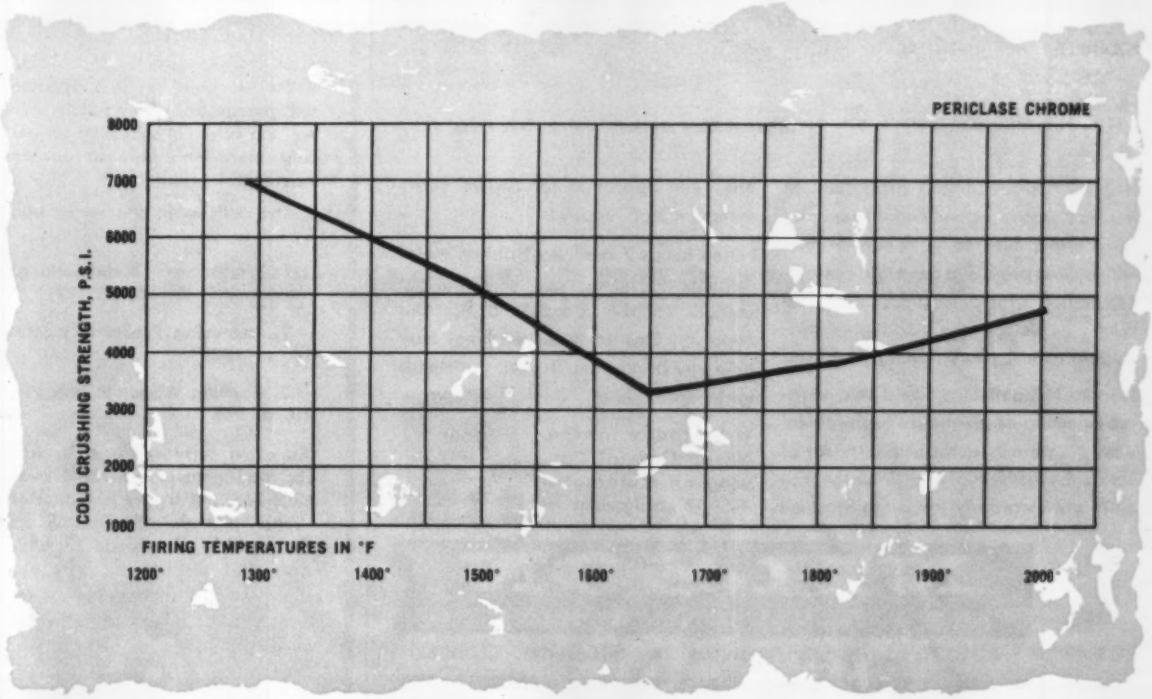
Call or write Kaiser Chemicals Division, Dept S9231, Kaiser Aluminum & Chemical Sales, Inc., at any of the regional offices listed below:

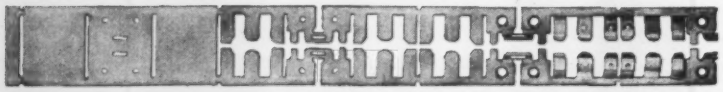
PITTSBURGH 22, PA. . . . . 3 Gateway Center
HAMMOND, IND. . . . . 518 Calumet Building
OAKLAND 12, CALIF. . . . . 1924 Broadway

KAISER CHEMICALS

Pioneers In Modern Basic Refractories

Refractory Brick & Ramming Materials • K/R Gunning Systems • Castables & Mortars • Periclase • Deadburned Dolomite • Aluminas





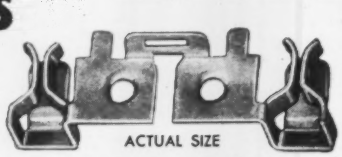
Blanking, Piercing and Preforming in Press

Cutoff

Partial Forming with Slides

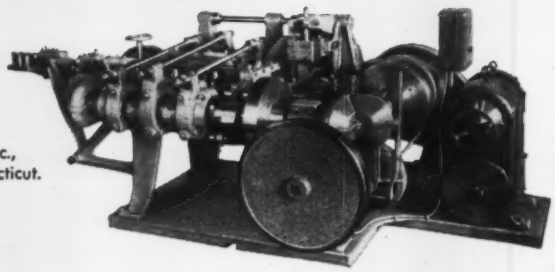
NILSON 4-SLIDE

BLANKS *and* FORMS IN ONE CYCLE!



ACTUAL SIZE

Final Forming with Slides



MANUFACTURER:
Harvey Hubbell, Inc.,
Bridgeport, Connecticut.

PRODUCT:
Contact Spring.

PRODUCTION:
136 Parts Per Minute.

Nilson 4-Slide Machine with Built-in Press

Harvey Hubbell shifted production of this part from a conventional press and progressive dies to a Nilson 4-Slide with built-in press. The immediate results: elimination of two secondary operations . . . simpler die . . . higher production rate . . . no stripping problems.

Harvey Hubbell also found that vertical mounting of die makes replacement easy . . . permits automatic disposal of scrap by gravity. And maintenance costs are incredibly low—this machine has been operating for twelve years without major repairs!

Nilson builds 7 models of ribbon metal forming machines, with built-in press sections ranging from 5 to 75 tons capacity. One of these machines may help you bring your stamping methods up-to-date!

Write today for the Nilson General Catalog on Automatic 4-Slide Equipment.

NILSON
THE A. H. NILSON MACHINE CO.
605 Bridgeport Avenue • Shelton, Conn.

AUTOMATIC WIRE & RIBBON METAL FORMING 4-SLIDE MACHINES • WIRE & STOCK REELS • WIRE STRAIGHTENING EQUIPMENT • AUTOMATIC STAPLE FORMING MACHINES • SPECIAL WIRE FORMING EQUIPMENT

Coming May 18

Giving More Public Service

One of the problems of our expanding economy is that company growth has been accompanied by a decline in the owner-manager relationship with workers—a situation that has enhanced union power.

One way to restore that relationship with bluecollar people is to spend more time in public service. That means soliciting for the community fund, or serving on the town council or school board, or participating in politics on the community level (and "community" is as broad as a man's horizons).

The next article in STEEL's 1959 Program for Management will demonstrate how public service can have an influence on getting more equitable labor-management legislation.

The articles in the series published to date:

1. **Profile of Metalworking's Managers (Feb. 16, p. 137)**

2. **Improving Productivity (Mar. 16, p. 103)**

3. **Keeping Wages in Line (Apr. 13, p. 95)**

An extra copy of these Program for Management articles is available until the supply is exhausted. Write Editorial Service, STEEL, Penton Bldg., Cleveland 13, Ohio.

KEEPING WAGES IN LINE

"CERTAINLY OUR WAGES and salaries are in line—we pay the average rates for our area and industry."

Nearly 99 out of 100 managements will respond that positively to a query about their pay levels.

But most of them flinch when you rephrase the question to: Are your *employment costs* in line? It touches a real sore spot.

Keeping wages in line implies more than adhering to industry and area pay levels.

It means getting a dollar's worth of output for a dollar's pay.

It means maintaining a good balance between employment and other costs so that profit ratios are realistic.

Four Point Attack

All metalworking is watching the prenegotiation maneuvering of the United Steelworkers and Big Steel. But you, and other thoughtful managers, should be taking more than a spectator's interest in the outcome. Some wage increases will

come out of that session, and you'll be expected to follow suit.

But wages are only part of the problem. It's equally important to take steps to insure that you get value received for the money you spend on employment.

To make sure your wage and salary costs get back (or stay) in line, industry leaders suggest that these things should be done now:

- Analyze your employment costs to determine how much of an increase you'll be able to afford. Place special emphasis on the nonproductive labor, whitecollar, and salaried employee costs. You'll have to grant them an equivalent increase. These are the areas in which costs are most out of line today.
- Scrutinize your labor contract with an eye toward eliminating hidden cost provisions at the next bargaining session.
- Re-evaluate your incentive program. Ask: Are your incentives doing the job? Do you want to include more people under incentives? Should you take a look at a new approach?
- Look at your over-all company climate. One company president put it this way: "Do you get the feeling that your managers are providing leadership, or is it mere pushership? Do you sense a certain bounciness to the hum of your plant, or is it a dull, dragging drone?"

These managers suggest... Four Ways

Know Your Wage Costs

Most of the headaches in controlling factory costs are generated in the nonproduction labor areas, believes Leonard C. Welles, vice president, All-Steel Equipment Inc., Aurora, Ill., a producer of metal office furniture.

"Assembly line labor costs are pretty well regulated by production volume," he relates. "Too often, nonproduction line units and staff groups tend to grow in accordance with peak operation requirements." During the last year and a half, many firms have been able to trim some of the fat they accumulated in boom times. Both hourly and salaried employees have felt the ax.

There's no magic in Mr. Welles's formula: "Just keep whittling." He gets monthly breakdowns of all employment costs by numbers of people in each function—such as shipping, maintenance, services, inspection, and material handling, in addition to direct labor costs.

"I try to maintain a favorable ratio between the nonproduction and direct labor costs," he explains. "It's often difficult. For example: It's possible to have a production decrease without a proportionate decrease in the number of orders. They're smaller orders, but shippingroom and order processing costs remain high. But over-all, by keeping tabs on individual employment cost areas, we keep better control."

Incentives Help Boost Productivity

"We're sold on the use of incentives . . . it's the best way to help workers become more efficient," says Robert C. Ressler, vice president of Hoover Ball & Bearing Co. The firm is building incentives for its nonproduction workers on a workload basis. "With his job content well defined, he can plan his work better. This plus the incentive makes the man more eager to improve," Mr. Ressler points out.

Good Managers: The Key To Motivation

You can motivate your workers to greater performance. Carl L. Hecker, president, Oliver Corp., suggests generating this philosophy:

"Preparation for the future, whether on part of an individual or company, consists of doing a better job than our competition. Every employee in our organization has a corresponding competitor in the ranks of the competing companies."

Developing *wage-cost* consciousness among managers is an often overlooked approach. In many firms, general foremen and department heads can't make a $500 expenditure for equipment or supplies without sweating through an obstacle course of red tape. Yet they are relatively free to hire $5000-a-year workers when they feel a little pinched.

All-Steel Equipment provides its foremen and department heads weekly employment cost records so that the managers can judge their efficiency. At bimonthly meetings they talk over ways to reduce wage costs. Emphasis is on the interchange of ideas.

Many in top management are disturbed because it normally takes a crisis (like the recession) before managers in nonproduction areas really get wage-cost conscious.

Perhaps it's time you re-evaluated the employees and jobs in your department. Ask:

Is the job necessary?

Could two or more be combined?

Could that material handler work in the shippingroom part time?

How about having one secretary for two managers, instead of one for each?

But the experts advise: Don't reduce personnel by an arbitrary, across-the-board percentage. Such action penalizes the efficient manager whose wage costs are already in line.

to Keep Wages in Line

Watch Hidden Costs In Labor Contracts

Wage and salaries are only part of your wage package. "Poorly defined benefit clauses in the labor contract can be expensive," cautions F. J. Valentine, director of personnel, American Machine & Foundry Co. "There are hidden costs in these areas, too: Seniority provisions, company - union agreements, union - management committees."

Keep Close Tabs on Nonproduction Labor Costs

"Direct labor costs for most firms are pretty well regulated by production activity," explains Leonard Welles, vice president - manufacturing of All-Steel Equipment Inc. "But nonproduction work units and staff groups inherently tend to build up to handle peak operations." To help keep these costs in line, he suggests: Isolate the costs by function and numbers of people—you'll get better control.

Clause Cutting

The labor contract is loaded with more costs than fringe benefits and base wage rates. Examples: Shifting personnel because of seniority bumping privileges. Grievances over "average wage" clauses. Negotiating new rates and standards. Increases in benefit costs not covered by specific dollar limits. How much did such items cost you last year?

"One of the saddest sights in industry is to see new work-saving equipment sitting in the research department because negotiations for its installation can't be concluded," says John Roberts, president of Albert Ramond & Associates, consultants.

Medium and small sized firms have become strapped with the extra costs in labor contracts. One major reason: Too many negotiators have been interested primarily in direct costs—wages and fringes. Once they are concluded (generally most of the heat of bargaining generates from them), they are willing to settle quickly for the so called "non-economic" provisions to get back to work.

The best way to combat the situation is to select your bargaining team and top negotiator with care.

Also, if you don't have a first-rate "contract" man, call in a consultant who can guide you around back alleys that lead to hidden costs.

Your chief negotiator sets the

GE's Employee Relations Thermometer

General Electric Co. has developed its Employee Relations Index (ERI) to check the "temperature" of its employee relations. Six factors go into the ERI formula:

Absences	**Accidents**
Tardiness	**Suggestions**
Resignations	**Benefit Plan Participation**

The record of each employee work group within a plant is computed monthly. The data are combined in a formula which produces an index figure. The basic objective: To measure the extent to which employees accept and perform in terms of company objectives and policies.

Officials admit ERI has some shortcomings. But during its seven years, many managers have found it a useful tool to trace trends in employee relations over a period, to pinpoint potential trouble spots quicker (it also aids in planning remedial action), to help control personnel costs.

Here are the typical characteristics of high and low ERI groups:

High ERI	Low ERI
Active in company-sponsored activities.	**Always give you an argument.**
Do their fair share of dirty-work.	**Avoid work whenever they can.**
Housekeeping is good.	**Careless with equipment.**
Quality is excellent.	**Don't respect superiors.**
Work hard, smoothly together.	**Often seek transfer to other units.**
Submit suggestions for improvement.	**Gripe about pay rates.**

tenor of the company's position. Make sure:

1. That he has the support of top management to take the occasional risk necessary to drive a hard bargain.

2. That he has strong personal characteristics. Too often, medium and small firms select career industrial relations managers who are more concerned with their security than in fighting for a good contract.

3. That the negotiator has no reason to feel resentment toward the company for treatment he has received. This can lead to "spite" concessions which can be easily rationalized. It's no secret in many firms—large and small—that 90 per cent of the employees root for the union at bargaining time because "it's about the only way to get a raise around here."

Another reason medium and small size firms are paying more attention to the hidden contract costs: It's getting tougher for them to match key industry settlements. Look for this problem to create more labor trouble at the local level in the next year.

Motivate from Pocketbook

You can still start a heated debate on the value of incentive programs. The purists say "No." They maintain: Treat the employee like

a human being, give him a fair wage, provide good supervision, and you'll get a fair day's work in return.

The proponents of incentive say: Give the employee all those things and an incentive. Then he'll boost his productivity.

STEEL's contacts with consultants, associations, and metalworkers indicate that incentives are getting increasing attention in the battle to keep wages in line. Again, the emphasis is on the nonproduction labor, whitecollar, and salary groups. Their costs are increasing the fastest when they are related to unit of output.

A survey last fall by a New York consulting firm, George Elliott Co. Inc., gave this evidence in support of incentives: Most firms can expect an average productivity increase of 50 per cent, a decrease in unit costs of 25 per cent, and higher wage payments of 20 per cent. The study covered 305 installations by 17 professional consultants.

A. T. Kearney & Co., Chicago consultant, lists these "must" factors in any incentive program:

1. The incentive should be fair reward for acceptable work done in addition to the required work standard.

2. The base rate should represent fair compensation for the standard output. Pick your own philosophy here. Many firms operate under a low base rate and high incentive potential. The disadvantage: If there's a wide spread of abilities in the department, the morale of low producers may drop. At the other extreme is the high base, low incentive approach. Its drawback is that many of the complacent will feel that pushing harder for that extra 5 or 10 per cent isn't worth the effort.

3. Incentive pay should be calculated on as short a period as practical. The work shift is the recommended period.

4. Incentive pay earned in one period should not be reduced because of failure to meet standard in another period.

5. Incentive pay should never be guaranteed. It must always be earned.

6. Incentive pay should be limited only by the individual's opportunity, ability, and willingness to work harder. Arbitrary limitations on earnings lead to equally arbitrary limitations on production.

7. Incentives should be determined on an individual basis when it is practical and equitable to do so.

Why They Fail

It hasn't been too difficult for professionals to set up standards and incentive systems for production workers.

Failures—and there have been many—can usually be traced to loose standards, improper work measurement, complicated formulas, or inadequate administration. Once installed, the system must be kept up to date.

The average cost of maintaining a system is 3 to 5 per cent of the payroll costs of those covered, most firms report.

Hoover Ball & Bearing Co., Saline, Mich., is one of many companies with incentives for nonproduction workers—about 50 per cent are covered, including stock handlers, setup men, salvage operators, shipping people, and heat treating crews.

Hoover puts heat treating in the nonproduction category because its operators are not running the equipment full time. During nonoperating periods, the crew handles stock.

Nonproduction jobs will never be measured as precisely as assembly line jobs, says Albert Ramond & Associates, the consulting firm working with Hoover. But the time study approach is about the same in both applications. Jobs are broken down into elements. Nonproduction tasks generally involve three broad factors:

1. Direct work, which normally includes easily measured, routine elements.

2. Indirect work, such as travel or walking, planning, securing equipment and material, and changing jobs.

3. Delay variables, including controlled and uncontrolled waits and delays.

One of the real benefits of incentive programs for nonproduction jobs comes from the job evaluation they require. Many companies haven't evaluated job content in years. Fertile areas in which the work force can be reduced are being found in activities like maintenance, inspection, shop clerical,

HIDDEN COSTS in the Labor Contract

- **Restrictions on subcontracting.**
- **Benefit clauses which specify coverage without dollar limits. Example: Hospitalization costs for semiprivate room. When negotiated, room costs may be $16. Six months later, they may be $20.**
- **Provisions which permit negotiation of work standards.**
- **Seniority provisions which . . .**
  permit excessive bumping,
  take precedence over merit in promotions and transfers.
- **Poorly defined clauses covering "average earnings" for temporary work in different job classification.**
- **Restrictions on management's right to introduce new or improved methods or facilities, to alter or discontinue any operations.**
- **"Union approval required" provisions.**

Morton's Employees Boost Productivity

Average Bonus Paid, Percentage of Earnings	
1955	2.2
1956	5.2
1957	10.1
1958	17.4

"Four years ago, it became pretty obvious that our salary and wage costs were getting out of line," says Thomas Morton, controller of Morton Mfg. Co., a Michigan machine tool builder.

"We installed the Rucker Share of Production plan because it fit our operations better than conventional piecework incentive systems. The Rucker plan, in effect, measures value added by manufacture—sales value of output, minus all costs of materials, supplies, power, other expenses (see below). Studies made by the consulting firm of Strong, Narovec & Co. (Rucker plan licensee) indicated that in the five-year period preceding 1955 our employees received a total compensation of 34.8 per cent of this production value, and the company's share was 65.2 per cent. They became our base standards."

Morton computes its production value every two months. When the regular earnings paid (overtime and fringe benefits included) are less than the 34.8 per cent of the production value, the difference represents the bonus earned by employees. (See examples at right.)

An important factor is the suggestion system. Employees boost their production value not only by better utilization of their time but also in better utilization of materials and supplies, such as perishable tools, cutting oils, and welding rods.

Each month the Rucker committee—composed of representatives of each department, plus a management member—reviews all suggestions turned in. "We average one suggestion for each ten employees per month—about 50 per cent are usable," Mr. Morton says.

"The greatest value of the plan," he emphasizes, "has been that it unified the employees toward the improvement goal. They know that any savings will result in a bonus for them. They have learned the value of cost cutting and where to look for it."

receiving, shipping, and often supervision.

Try Group Approach

Many companies have been discouraged by the complexity of establishing job standards and the difficulty in developing adequate incentive formulas. Profit sharing plans have met the requirements for some. For others who feel profit sharing covers too long a period and doesn't spark enough day-to-day incentive, approaches like the copyrighted Rucker Share of Production plan answers the need. Developed by Allen W. Rucker, president of Eddy-Rucker-Nichels Co., Cambridge, Mass., it relates a company's employment costs to its value added by manufacture or *production value* figure.

A firm's production value, says Mr. Rucker, is the value of its sales output, minus the cost of its raw materials, components, supplies, power, and like items that must be purchased. Wages are an internal operating expense that must be paid from income, so they are a measurable proportion of the production value. Salaries, nonpayroll oper-

ating expenses like depreciation and insurance, and ownership obligations (income taxes, dividends) represent the company's share of production value.

Briefly, the Rucker plan operates like this:

Company records are analyzed to determine the percentage relationship between wages (including overtime and fringes) and production value. This percentage becomes the base for determining the employee bonus. At the end of the calculating period, if the total wages paid out were less than the established percentage proportion of production value, the difference represents the bonus.

(See Morton Mfg. Co.'s experience in the exhibit on Page 100)

What's in a Job

Company "climate," the big intangible, is still rated by most managers as the key factor in motivating employees to greater performance. "And don't confuse high morale, good group cohesiveness, and happy workers with climate for high productivity," they emphasize.

University of Michigan studies show that low productivity groups can be as close-knit as high productivity groups. And a happy worker can be a member of either high or low productive groups.

One experiment is General Electric Co.'s Employee Relations Index, see Page 98. ERI basically measures how much employees co-operate with the company. It uses these indicators of climate:

Absences.
Tardiness.
Resignations.
Accidents.
Suggestions.
Benefit plan participation.

GE officials report that in seven years the program has permitted some interesting comparisons — though no necessarily valid conclusions:

- Plants with higher ERIs have tended to have higher profitability ratios.
- In checking performance records of work groups, there has been some relationship between high ERI and high productivity. But some officials believe that there may be a better correlation between ERI and quality because productivity is often paced by the machine or assembly line.

Perhaps the greatest value of ERI is that it records the factors involved and forces the individual manager to look at them in perspective—the monthly records will tend to indicate patterns.

The patterns serve to highlight *potential* trouble areas so that cor-

Here's How Employees Share Production Value Gains

1. SAVINGS IN MATERIALS AND FACTORY SUPPLIES.

	Present	With Savings	Value Added
Sales Value of Output	$150,000	$150,000	
Deduct: materials and supplies	50,000	40,000	$10,000
Production value	$100,000	$110,000	$10,000
Employees' share (34.8%)			$ 3,480

2. ELIMINATING REWORK, SCRAP, FIELD SERVICE NEEDS

	Present	With Savings	Value Added
Sales Value of Output	$150,000	$160,000	$10,000
Deduct: materials and supplies	50,000	50,000	
Production value	$100,000	$110,000	$10,000
Employees' share (34.8%)			$ 3,480

3. MORE EFFECTIVE USE OF MANPOWER AND MACHINERY

(such as improvements in product design, scheduling)

	Present	With Savings	Value Added
Sales Value of Output	$150,000	$180,000	$30,000
Deduct: materials and supplies	50,000	60,000	— 10,000
Production Value	$100,000	$120,000	$20,000
Employees' Share (34.8%)			$ 6,960

4. ALL SAVINGS IN LABOR COSTS ARE RETURNED

	Present	Without Overtime
Production value	$100,000	$100,000
Employees' Share (34.8%)	34,800	34,800
less factory labor cost	30,000	30,000
less overtime cost	4,800	
Bonus earnings		$4,800

Efficiency Starts with Leadership . . .

How's Your Managership Rating?

	Yes	No
1. Do you readily accept responsibility for your mistakes rather than looking for a scapegoat?	___	___
2. Do you treat all of your subordinates equally?	___	___
3. When you promise something, do you follow up to make sure it's done?	___	___
4. Do you tackle problems head-on, or are you indecisive and evasive?	___	___
5. Are you consistent in your interpretations of company policies to subordinates?	___	___
6. Do you actively encourage suggestions from subordinates and look at them objectively?	___	___
7. Do you follow up on feasible suggestions, or do you let them gather dust in your files?	___	___
8. Do you keep your people informed of company plans and activities as much as possible?	___	___
9. Do you discipline subordinates fairly and reprimand them in private?	___	___
10. Do you accept criticism and constructive suggestions in the spirit in which they are intended?	___	___
11. Do you set the pace by doing a full day's work yourself?	___	___
12. Do you delegate as much of your work as you can, or do you feel that subordinates can't be trusted with other than routine assignments?	___	___
13. Do you feel that the development of subordinates is your primary responsibility, or do you subscribe to the sink-or-swim theory of training?	___	___
14. Do you make it a point to tell subordinates how they're doing, or do you leave them in the dark?	___	___
15. Do you readily accept new ways of doing things, or do you resist change?	___	___

rective action can be taken before anything serious occurs.

For example: ERI pointed up one work group with a relatively high absence record. Further checks indicated that about six employees were common offenders—two of them serious offenders. After the managers took the usual steps—first warnings followed by normal disciplinary procedures, the absences dropped sharply. ERI rose to normal company averages.

Manager Still the Key

Company climate is largely determined by one factor: Your ability as a manager. You, for the most part, mix the ingredients that make up the climate of your department, division, or plant.

The University of Michigan study proved that foremen with five characteristics (they apply to all supervisory and management jobs) consistently have the highest productivity:

1. Managers with the best productivity records are those who devote more time to planning and jobs that call for special skills than they do to "pitching in" on the routine work.
2. Their subordinates generally recognize them as better administrators than those who often "help out in the shop."
3. High productivity managers emphasize training of employees to do their present job better, as well as for the next higher job.
4. Better managers show an interest in the individual's problems, both on and off the job. They are more understanding and less punitive when mistakes are made.
5. Managers with the best records do not breathe down their subordinates' necks. They give adequate instructions and permit the employee as much freedom as possible in working his own way.

The Challenge

Few of us, as managers, can affect the wage settlements at the bargaining table. The market place determines the pay levels of our salaried employees.

But each of us can keep wages in line by getting more out of our employment cost dollar through better performance.

"Sweet little money-maker... before we put the wheels on!"

Funny joke! But the boss is not amused.

His company supplies the body of that cart to other manufacturers — successfully, too. Just recently he decided to market a model of his own, complete with wheels. Yes . . . they're selling fast. But the company's losing money on every shipment.

What happened? With late and inadequate cost reports on that wheel assembly, the price was set too low. Weeks passed before the boss found out. And it'll be weeks more before his profits stop taking a licking.

How different with Automatic Keysort punched-card controls! With Keysort's meaningful *on-time* job-cost summaries, management would have known how costs were running at every stage . . . could have acted *fast* to keep them in line. Thus, price could have been set to *cover* cost . . . and the new product marketed with a healthy profit included.

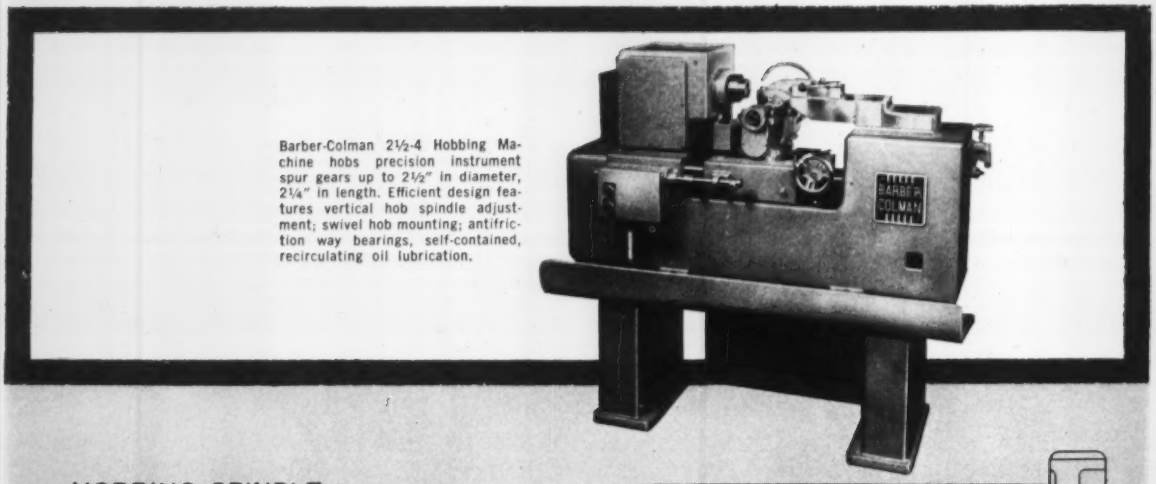
Automatic Keysort is today's only data processing system that provides automatic creation and processing of original records. Speeding vital day-to-day and long-range facts essential to sound management, this unique system employs simplified machines and methods which can relieve your personnel from many routine clerical functions.

With the Automatic Keysort System, manufacturing concerns of every size can now enjoy fast, accurate data processing on either a centralized or decentralized basis. At remarkably low cost . . . without restrictive, complex procedures . . . without specialized personnel.

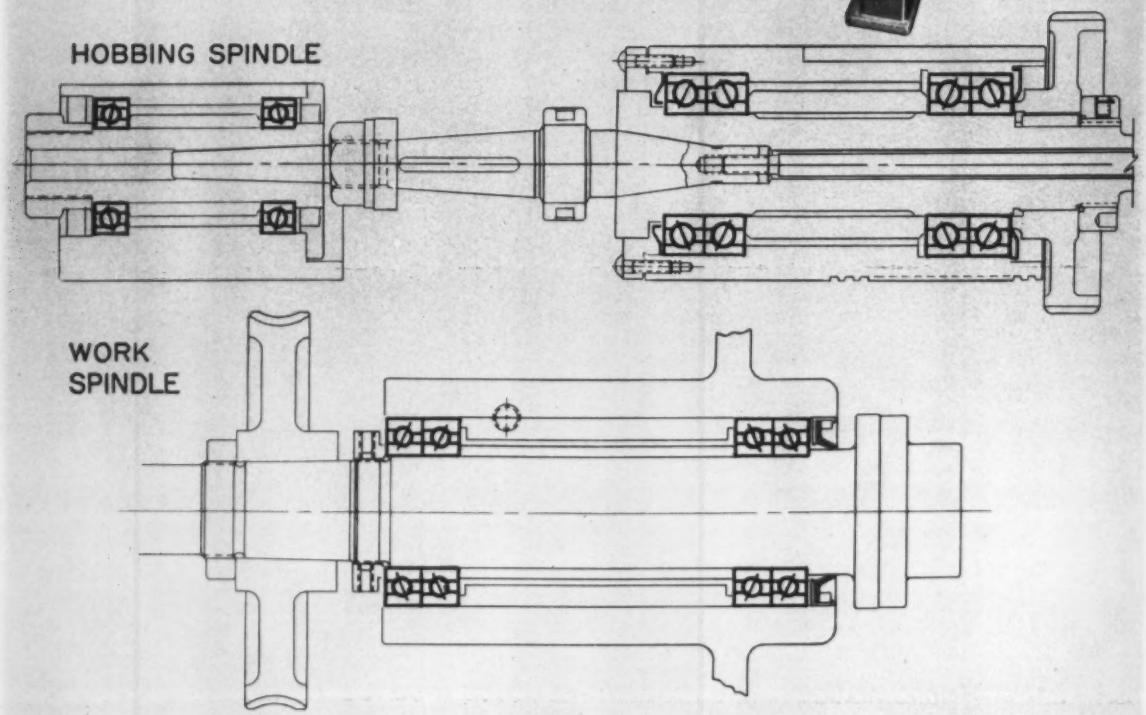
Call your nearby Royal McBee Data Processing Representative, or write Royal McBee Corporation, Data Processing Division, Port Chester, N. Y. for illustrated brochure F-2.

ROYAL McBEE · *data processing division*

NEW CONCEPTS IN PRACTICAL OFFICE AUTOMATION



Barber-Colman 2½-4 Hobbing Machine hobs precision instrument spur gears up to 2½" in diameter, 2¼" in length. Efficient design features vertical hob spindle adjustment; swivel hob mounting; antifriction way bearings, self-contained, recirculating oil lubrication.



Relative rotation of hobbing machine spindles held accurate within 20 seconds using Fafnir Ball Bearings

New Barber-Colman 2½-4 machine precision-hobs spur gears for instruments

If two words can sum up the design of Barber-Colman's new 2½-4 Hobbing Machine, they are *accuracy* and *rigidity*.

Developed for hobbing AGMA Precision Class 3 fine-pitch spur gears for guidance systems, the 2½-4 has a minimum number of parts at points where deflection or inaccuracies might occur.

In selecting bearings which would complement the accuracy of the gears in the machine, Barber-Colman designers got the performance they wanted with Fafnir super-precision ball bearings. Single row, extra-light, counter-bore types, eight used in duplex pairs, help maintain indexing accuracy within *20 seconds*.

The application is typical of thousands Fafnir has handled where performance requirements put an extra premium on bearing selection. Chances are, Fafnir experience — plus breadth of line — can answer bearing problems you may have. Write The Fafnir Bearing Company, New Britain, Connecticut.

FAFNIR
BALL BEARINGS

10 Fafnir Extra-Light Super-Precision Ball Bearings, snug fit, support the Barber-Colman 2½-4 machine spindles. 4 variations, equipped with composition retainers, are available in this one series to meet specific load and speed requirements where exceptional rigidity is wanted.

ALUMINUM CEMENT MIXERS—First deliveries of more than a score aluminum cement mixers are being made to a Portland, Oreg., firm. Lighter construction means that trucks can carry an extra yard of concrete per load without violating road weight restrictions. To put it another way: Seven cement trucks can now do the work of eight made of steel. Tests on aluminum resistance to abrasion showed negligible wear after 10,000 cubic yards of cement had been mixed in the vessels. Even mixer blades showed relatively no wear, says Construction Machinery Co., Waterloo, Iowa.

BETTER GRIP FOR BAGS—Handling bags of materials like cement is a lot easier with a new, nonskid paper developed by Armour Research Foundation, Chicago. The embossed surface increases the coefficient of friction several hundred per cent.

NO-BLEMISH WELDING—You can join fasteners to thin pieces of stainless without the usual heat discoloration by using a new resistance welding method developed by Primeweld Corp., Dearborn, Mich. Secret: A patented transformer which can deliver carefully controlled currents (low voltage and high amperage).

FILM GUARDS METALS—A new, scratch resistant film will cut handling costs for aluminum, magnesium, or stainless steel, in transit or during fabrication, says Industrial Metal Protectives Inc., Dayton, Ohio. The inexpensive coating is sprayed or rolled on. It air dries in 5 minutes to 80B Rockwell but comes off easily in a warm water rinse.

EXPLOSIVE BLANK AND PIERCE—"This year, we hope to have a high energy blanking press that will use ¼ in. templates made of cold-rolled steel," says Floyd A. Cox, manager of research and development, Ryan Aeronautical Corp., San Diego, Calif. He says that the templates are merely pinned to a heavy backing plate. The metal to be blanked is laid over the template and a sheet explosive placed on top. The blast will form and blank in one operation. Ryan expects to have 30 or 40 parts in regular production by the end of this week.

PLASTIC SEALS METAL POWDER PARTS—Impregnating green compacts with plastic is a good way to seal pores in powder metal parts, says American Metaseal Corp., New York. The plastic burns to carbon in sintering, but the residue acts like a conventional polyester impregnant.

TWO FOR ONE—A modified milling cutter is making rough and finish cuts in a single pass. The workpieces are cast steel housings. The trick: A 10 in. Kennamill cutter was altered by deepening alternate toolholder slots by ¼ in. Six finishing tools are clamped in the slots so they project about 0.030 in. beyond the six roughing tools. Grade K4H Kennametal is used on all cutters. Tool cost was chopped from $2.87 to 79 cents a part.

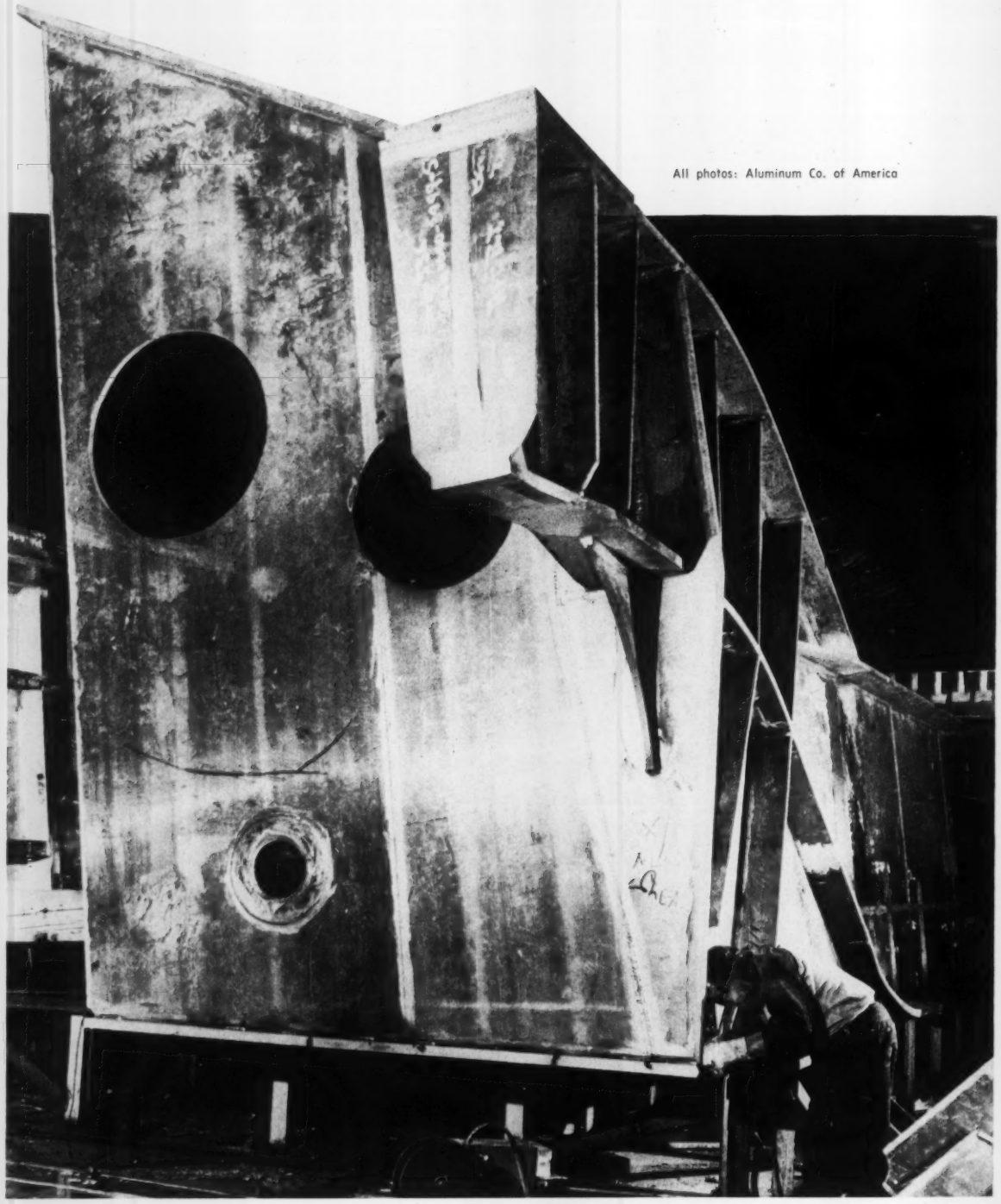
PROBES STRESS CORROSION CRACKING—Westinghouse Electric Corp. scientists can predict within 5 minutes the failure of a stressed metal sample in a corrosive environment. It's part of basic research in improving welded structures. The object: Better components for atomic reactors.

STOPPING STRESS-CORROSION—Users of stainless steel pressure vessels, boilers, and deep drawn or spun brass can stop stress corrosion cracking with a galvanic device called a cathodic protector. The National Bureau of Standards is pretty sure that stress-corrosion is an electrochemical process, not merely a chemical reaction.

STRONGER SHIPPING BOXES—A new treatment improves fiberboard's wet strength 60 per cent in a relative humidity of 90 per cent. Stanford Research Institute, Menlo Park, Calif., developed a plastic coating technique (Vapon) for the Glidden Co., Cleveland.

Aluminum-Magnesium Alloys Move into Structural Field

All photos: Aluminum Co. of America



Weldability and strength of these materials make them well suited for use in the chemical, power, transportation, marine, and structural fields. Many new uses are appearing

ALUMINUM - MAGNESIUM alloys are on the move. A resurging interest in the high strength materials for structural and pressure vessel applications has been sparked by modern welding techniques.

Weldability is probably their greatest asset. They can be inert gas arc-welded, arc cut, and resistance welded almost as readily as low carbon steels.

• **Mechanical Properties**—The alloys have excellent strength in the welded condition. (Alloy 5456 plates in the H321 temper have a minimum tensile strength of 44,000 psi.) Static tensile, fatigue, and creep and stress rupture properties tend to increase as magnesium content becomes greater.

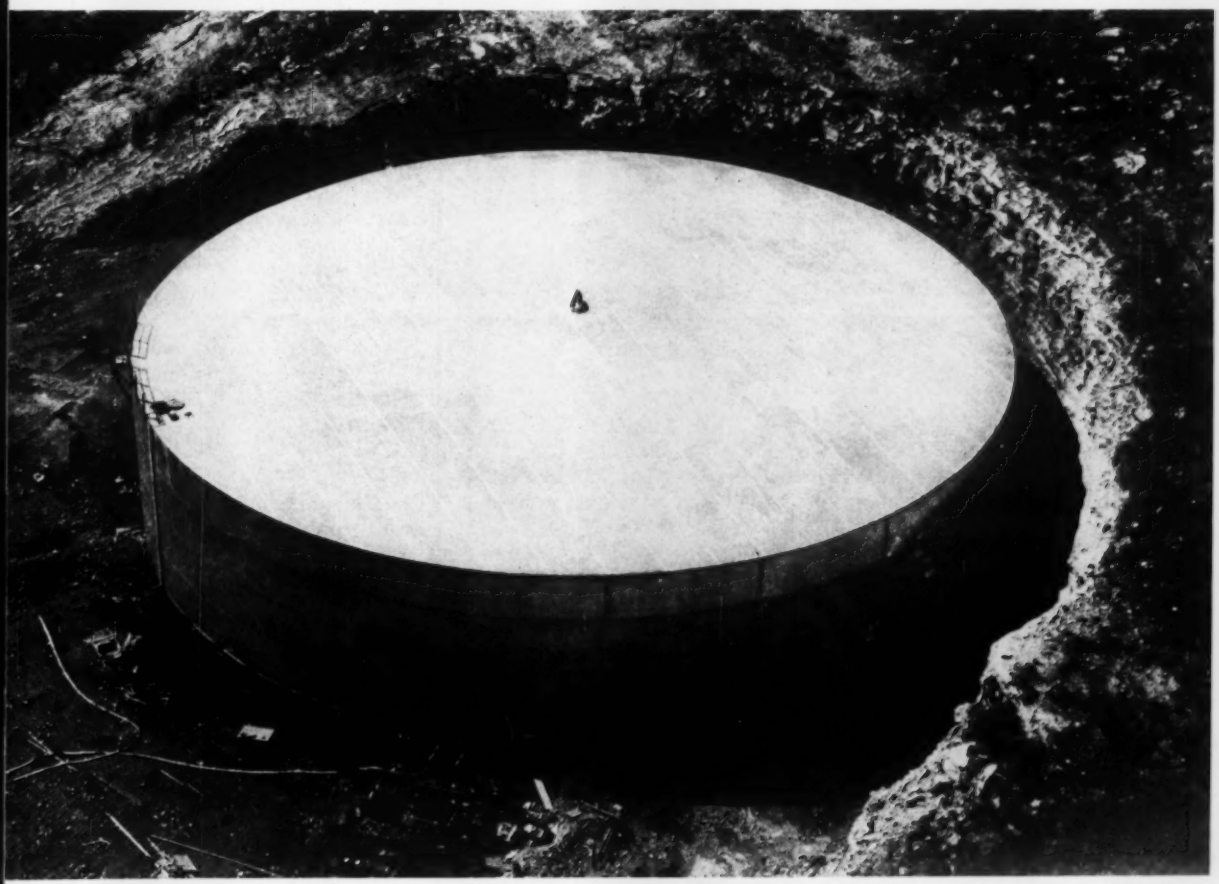
Fabricating characteristics (bending, forming, and drawing) are inversely proportional to magnesium content. Corrosion resistance is good.

The alloys are serving a number of industries in equipment and heavy duty structures. Here are a few reported by J. R. Willard, manager of Alcoa Sales Development Div., Aluminum Co. of America, New Kensington, Pa.:

Chemical Industry

Demand for extremely large storage tanks for corrosive chemicals has been increasing. One such tank was built by Chicago Bridge & Iron Co., Chicago, for the Mississippi River Chemical Co., Salma, Mo. The structure (it's 128 ft in diameter and 26 ft high) holds 2 1/3 million gallons of 83 per cent ammonium nitrate stored at 180° F.

Alloy 5052 is used for the tank wall in thicknesses up to 1⅞ in. The top and bottom are made of 3003. The 5052 alloy was selected because of the operating tempera-



Aluminum plates (alloys 5154 and 5356) were used to make this inboard supporting member of an elevator for the USS RANGER. The structure was welded by the inert gas, shielded arc method

All-aluminum storage tank in service at Mississippi River Chemical Co., Salma, Mo., has a 2-1/3 million gallon capacity. Sidewalls of the welded structure are made of alloy 5052

This aluminum dump truck (alloy 5454) has a capacity of 37½ cu yd. It weighs 27 tons. Wheels are more than 5 ft high

ture. If a tank of this size were to be built today, 5454 would be the most economical selection and would permit a design stress about 18 per cent higher than is available in 5052, points out Mr. Willard.

• **Low Temperature Uses**—The alloys also have desirable properties for processes requiring low temperatures. Aluminum alloys improve in tensile and yield strengths without embrittlement as temperatures go down. Cryogenic applications are ideal for alloys in the 5000 series (where magnesium is the chief alloying element). Aluminum equipment is used to handle liquid methane, ethane, hydrogen, oxygen, nitrogen, and helium.

Air separation equipment in a tonnage oxygen plant built by Linde Co., a division of Union Carbide Corp., New York, uses 5154, 5086, and 5456. The plants are incorporated in steel mills to provide enriched air to blast furnaces, oxygen converters, and open hearths.

• **Missile Tankage**—In the handling of liquid propellents for guided missiles, there is need for tankage on the missiles, as well as in transportation. In addition to oxygen, propellents contain 90 per cent hydrogen peroxide and red fuming nitric acid.

The chemicals are normally handled in aluminum tank trailers or tank cars. Because of the tendency for hydrogen peroxide to break down into water and oxygen, the practice is to select alloys of the 5000 series which have special controls on copper and manganese contents. For that reason, instead of alloys 5154 and 5052, their high purity counterparts, 5254 and 5652, normally are selected.

• **Aluminum Rail Cars**—Tank cars made of 5154, 5254, 5052, 5652, and the heat treatable 6061 are handling a variety of chemicals. They include hydrogen peroxide, ammonium nitrate, acetic acid, and nylon salts.

Selection of aluminum is based on its high resistance to corrosion, easy workability, freedom from unwanted color, and low cost compared with other noncorrosive metals.

Power Industry

It is becoming practice in modern central station powerplants and atomic energy installations to store high purity water and condensate in aluminum storage tanks and distribute them in aluminum pipe, says Mr. Willard.

The advantages offered by aluminum are freedom from maintenance, inside and outside of the tanks, and substantial reduction in the iron contamination of the boilers. For atomic energy applications, low cross section and short half life are advantageous.

Two aluminum condensate storage tanks at the Bergen station of Public Service Electric & Gas Co. are constructed of 5086. They were fabricated by Chicago Bridge & Iron Co.

An all-aluminum vacuum deaerator built by Patterson-Kelley Co., East Stroudsburg, Pa., has a 5154 tower packed with aluminum Raschig rings. Well water is charged to the column, and oxygen and carbon dioxide are removed.

Transportation

Highway trailers that convey hot fluids are being built from 5454. The alloy allows design to the stresses permitted with the 5154 alloy, but without the temperature limitation imposed on 5154. Two trailers built by Butler Mfg. Co. are used to haul hot asphalt from a batch plant to a mixing station.

The asphalt is loaded at 250 to

400° F and may be carried as far as 400 miles. Fiberglas insulation is used on the tank exteriors and 3003 alloy sheeting is placed outside the thermal insulation.

• **Increases Truck Payload** — A frameless semitrailer dump body constructed by Williamson Body & Equipment Co., Ogden, Utah, is used in southeastern Utah to haul uranium ore from the Hidden Splendor Mine to Moab, Utah.

The payload is 44,000 lb, a full 4000 lb greater than would be permissible with comparable designs of heavier metals. The result is an extra profit of about $36 a day for each unit, assuming six trips per day during the 16 hour period of operation. In this service, the dump body is expected to last about five years. Operating economies pay off the additional cost of aluminum over other materials in less than 100 working days. The body is made of 5086 alloys, using 6061-T6 external structurals.

A 1040 cu ft, double hopper aluminum trailer (5052 alloy) has been built by Butler Mfg. Co. for hauling bulk commodities like coal, cement, alum, rock salt, fertilizers, and feeds.

Aluminum cylinders for liquefied petroleum gas, made by Benson Mfg. Co., Kansas City, Mo., offer lightness and resistance to corrosion. A cylinder contains 100 lb of gas, weighs 48 lb, and offers a saving of 22 lb, compared with a similar cylinder of heavier metal. The tanks are made from two drawn shells of 5154.

Marine Applications

The superstructure of the *S. S. Sunrip*, built in Canada for Alcan Saguenay Terminals Ltd., employs 136 tons of aluminum, including deck houses made of 5052.

A 52 ft, all welded personnel boat was built of 5154 by Peterson Boat Yard, Tacoma, Wash., for service in Lake Maricaibo, Venezuela. Unprotected aluminum alloys exhibit at least ten times the resistance to corrosion shown by mild steel in this water. Pipelines, drilling templates, and numerous oil country structures are made of aluminum for service in this area.

The yawl *Dyna*, winner of two Mackinac sailing races, had a welded hull constructed of 5154 throughout.

Heavy Duty Structures

A welded aluminum crane structure has been built of 5456 by Northern Engineering Works, Detroit, and the Milwaukee Crane Co., Milwaukee. The box girder structures span 52 ft center to center of crane rails.

An aluminum highway bridge over an interstate highway near Des Moines, Iowa, was a joint research project of Aluminum Co. of America, Kaiser Aluminum Co., and Reynolds Metals Co. Pullman Standard Car Mfg. Co., Chicago, fabricated the structure, using 5083-H113 welded with 5183 filler wire. It's 220 ft long and has three intermediate supports. The composite design has a concrete deck, using aluminum shear connectors.

• *An extra copy of this article is available until supply is exhausted. Write Editorial Service, STEEL, Penton Bldg., Cleveland 13, Ohio.*

Alloys in the Aluminum-Magnesium Series

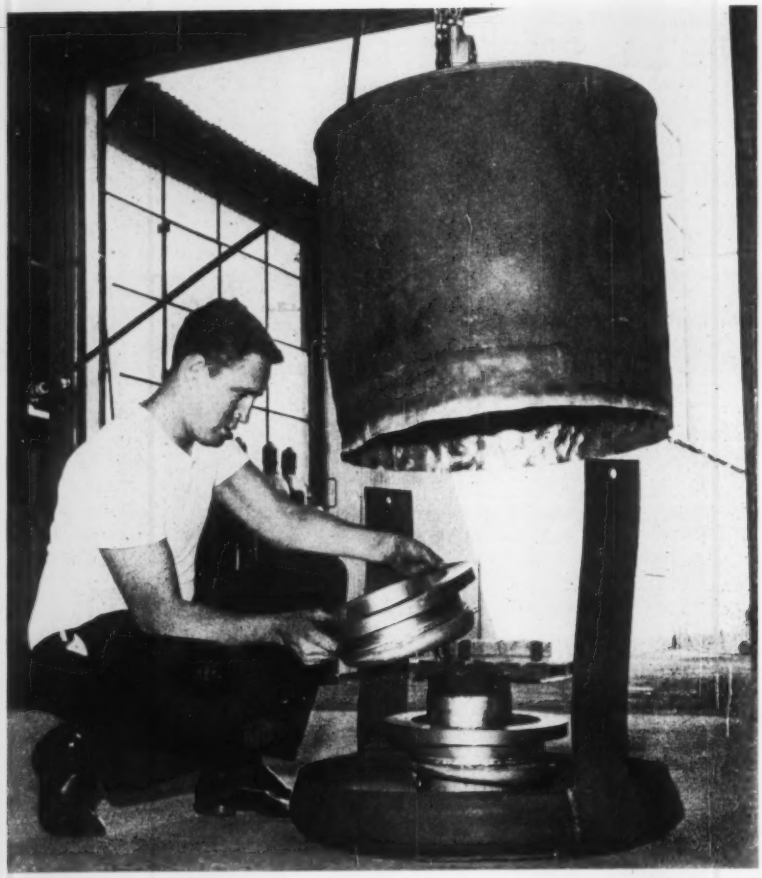
Alloy No.	Composition % max or range. Al remainder	Commercial Forms*
5005	Si 0.40; Fe 0.70; Cu 0.20; Mn 0.20; Mg 0.50-1.10; Cr 0.10; Zn 0.25	S
5050	Si 0.40; Fe 0.70; Cu 0.20; Mn 0.10; Mg 1.00-1.80; Cr 0.10; Zn 0.25	S, W, B, T
5052	Si & Fe 0.45; Cu 0.10; Mn 0.10; Mg 2.20-2.80; Cr 0.15-0.35; Zn 0.10	S, W, B, T
5056	Si 0.30; Fe 0.40; Cu 0.10; Mn 0.05-0.20; Mg 4.50-5.60; Cr 0.05-0.20; Zn 0.10	S, W, E
5083	Si 0.40; Fe 0.40; Cu 0.10; Mn 0.50-1.00; Mg 4.00-4.90; Cr 0.25; Zn 0.25; Ti 0.15	E, plates
5086	Si 0.40; Fe 0.50; Cu 0.10; Mn 0.20-0.70; Mg 3.50-4.50; Cr 0.25; Zn 0.25	S
5154	Si & Fe 0.45; Cu 0.10; Mn 0.10; Mg 3.10-3.90; Cr 0.15-0.35; Zn 0.20; Ti 0.20	S, W, B, T
5155	Si 0.30; Fe 0.70; Cu 0.25; Mn 0.20-0.60; Mg 3.50-5.00; Cr 0.05-0.25; Zn 0.25; Ti 0.15	S
5183	Same as 5083, except 4.30-5.2 Mg	W
5254	Si & Fe 0.45; Cu 0.05; Mn 0.01; Mg 3.1-3.9; Cr 0.15-0.35; Zn 0.03; Ni 0.03; Ti 0.03	S, W, B, T
5356	Si & Fe 0.50; Cu 0.10; Mn 0.05-0.20; Mg 4.50-5.50; Cr 0.05-0.20; Zn 0.10; Ti 0.06-0.20	W
5357	Si 0.12; Fe 0.17; Cu 0.07; Mn 0.15-0.45; Mg 0.80-1.20	S
5454	Mn 0.80; Mg 2.75; Cr 0.10 (nominal)	S, E
5456	Si & Fe 0.40; Cu 0.20; Mn 0.50-1.00 Mg 4.70-5.50; Cr 0.05-0.20; Zn 0.25; Ti 0.20; Be 0.0005	W, E, plates
5652	Si & Fe 0.45; Cu 0.04; Mn 0.01; Mg 2.2-2.8; Cr 0.15-0.35; Zn 0.10; Ni 0.05	S, W, B, T

*Abbreviations: S—flat-rolled products, sheets, strip, and plates. W—wire rods. E—extrusions. B—bars. T—tubes and pipe.

Alloy Increases Life of Furnace Parts

Retorts made of Hastelloy alloy X last longer because they aren't damaged by corrosive natural gas or temperatures up to 2300° F. Thinner walls save material and shorten brazing cycles; faster heating and cooling cut fuel costs. Here are some comparisons:

ALLOY	LIFE		COST	RETORT SIZE		
	Brazing Cycles	Days		Diameter	Length	Gage
Hastelloy Alloy X	400 (Minimum)	100	$600	18 in.	36 in.	0.125 in.
High Nickel Alloy Used Previously	250 (Average)	60	660	18 in.	36 in.	0.176 in.



Rocket component is placed in a fixture in the furnace retort. The shell is then sealed in place, and brazing is done in a protective atmosphere

FABRICATORS who braze high alloy assemblies are building longer life into furnace trays, racks, baskets, and retorts by making them of alloys that keep their strength at temperatures up to 2300° F.

Retorts used at Western Alloy Engineering Co., Montebello, Calif., are made of Hastelloy alloy X, produced by Haynes Stellite Co., Kokomo, Ind., a division of Union Carbide Corp. They give better performance than retorts of another alloy previously used at the company.

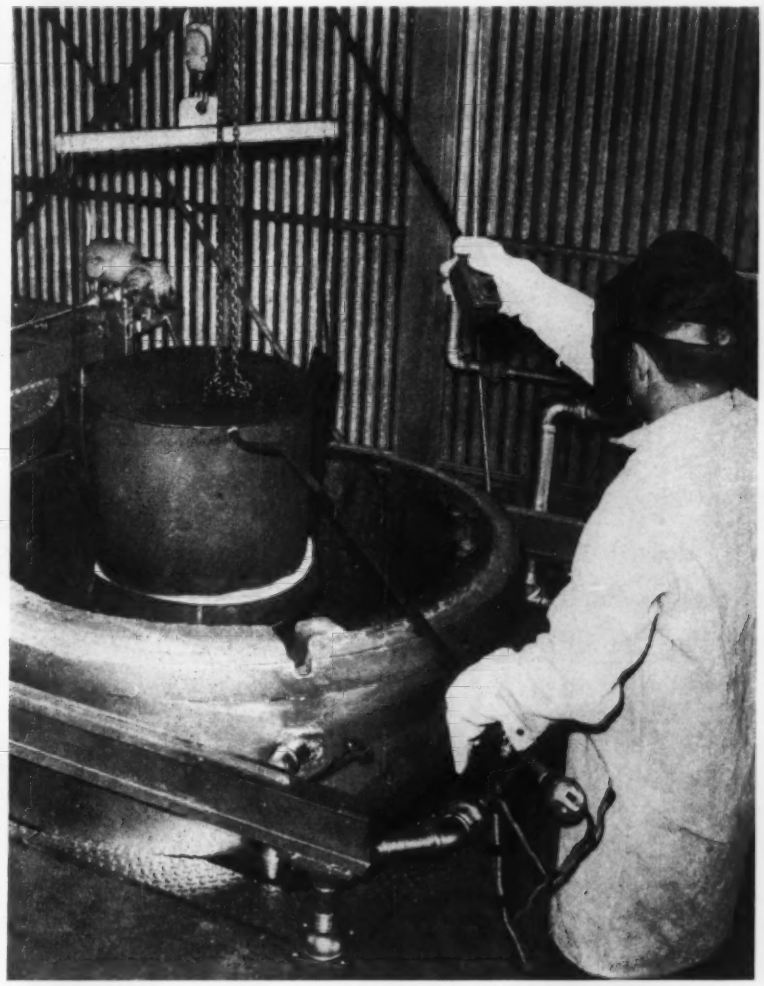
• Records show that alloy X retorts last longer and reduce fuel costs.

An alloy X retort, 18 in. in diameter, saves Western Alloy Engineering $1000 per 100 operating days, a company official reports. The alloy, with excellent oxidation resistance, has doubled the life of retorts, he says.

Fabrication costs are lower; brazing cycles are shorter; and fuel costs are reduced.

• Each retort is used as an atmosphere chamber, or shell. Parts being brazed are surrounded by argon or hydrogen.

Rocket parts of alloy X, well known in the aircraft industry, are often brazed in retorts made of the



At the end of the brazing cycle, the retort is cooled with an air bath, then removed from the furnace. Thin walls permit faster heating and cooling

same material. Retorts containing the parts are filled with argon or hydrogen, then sealed with a refractory material.

Temperature is raised rapidly after the retort is placed in the furnace and surrounded with untreated natural gas. Length of the brazing cycle is determined by the mass of the parts being brazed. Parts are cooled with an air bath before they're removed from the furnace.

Furnace parts made of the alloy keep their strength at temperatures beyond the operating limits of those made with other materials. They're not damaged by corrosive gases.

• **Material cost is lower than with the alloy previously used because less metal is used.**

Thinner sections of alloy X can be used to make the retorts (0.109 to 0.125 in. thick, vs. 0.176 for the material it replaced). By reducing wall thickness 40 per cent, the company cuts the cost of the retorts, even though alloy X costs slightly more per pound. Added benefit: Heating and cooling are 25 per cent faster, permitting more parts to be processed per hour.

The alloy is easily formed and welded by standard methods. A sheet of the material is rolled into a cylinder, 12 to 22 in. in diameter, and 48 to 60 in. high. A head, or cover is made for one end; sections are joined by metallic arc welding, with an alloy X rod.

Tractor Lift Eases Costs, Cuts Labor and Time

RIGHT MATERIAL HANDLING equipment reduced job time two-thirds and manpower requirements three-fourths at Joseph Smith & Sons Inc., Washington. The secret: A tractor lift for scrap processing operations.

• **Background** — Previously, the company needed three different pieces of equipment and a four man crew to move automobiles for dismantling. To pare costs, a better material handling technique was sought.

A rubber tired tractor shovel (Model 154, Yale & Towne Mfg. Co., New York) was selected. It can move cars or any piece of scrap in the yard or warehouse. Three pieces of equipment are no longer needed—a crane, warehouse mule, and a pole truck.

The time required to move automobiles from the assembling point to the dismantling point was cut 66 per cent. Labor requirements were trimmed 75 per cent. Only one man, the tractor operator, is needed. Three men have been reassigned.

The tractor handles all the loose and piled scrap in the yard with a 2 cu yd bucket. Inside floor problems are eased with the rubber tired unit. It can move engines and do other inside operations without causing floor damage.

• **Equipment**—The vehicle has four wheel drive and a 92 in. wheel base. It uses forks 6 ft long and 5 ft high to lift automobiles. Maximum lift height is 10 ft 9¾ in.

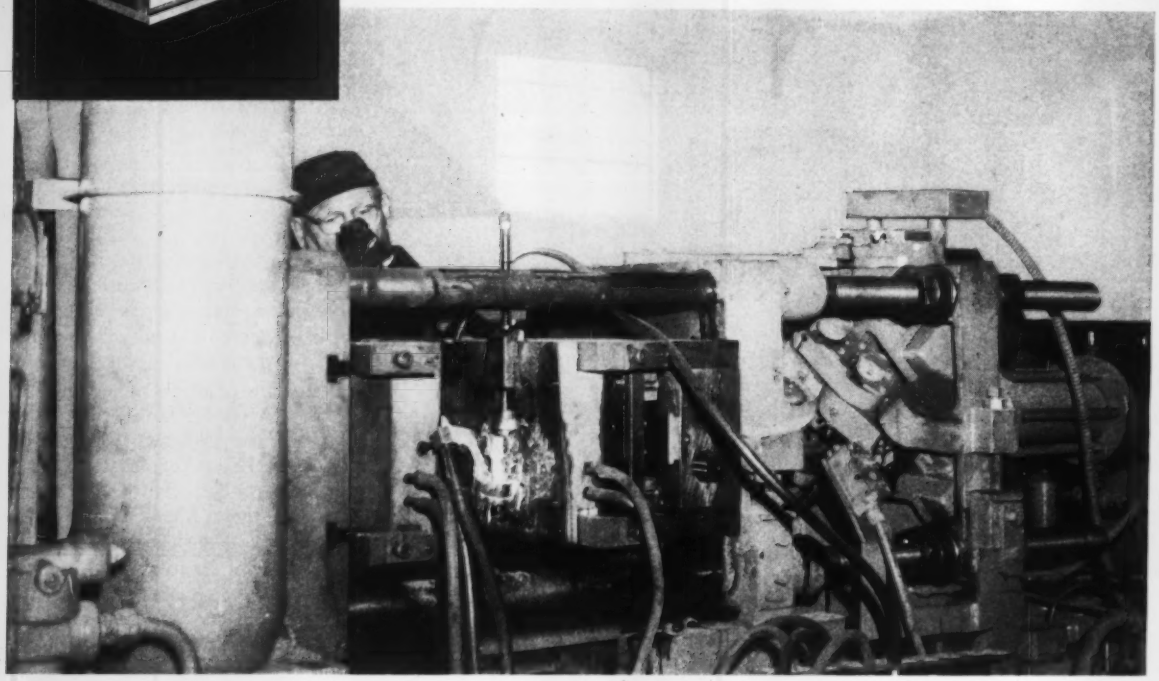
Powdered Metal Slashes Gear Cost

Selection of powdered metal for a gear saved 53 cents per unit at Chisholm-Moore Hoist Div., Columbus McKinnon Chain Corp., Tonawanda, N. Y.

The gear is pressed and sintered from an iron and copper blend made by Amplex Div., Chrysler Corp., Detroit. The gears are produced to close tolerances and require no machining. A substantial safety factor assures long life.

Unit Dies Cut Downtime

If you have a diecasting machine that isn't running at capacity because die changes are too expensive for a series of short production run jobs, take a look at Detroit Mold Engineering Co.'s standard die unit. Its interchangeable cavity inserts can be switched in 20 minutes



DIE CHANGES on a 150 ton diecasting machine that normally take 3 hours are squeezed into 20 minutes at DiSalle Plating Co. Inc., Toledo, Ohio. The secret: Unit die assemblies made by Detroit Mold Engineering Co., Detroit. It means DiSalle can run several jobs on a single machine.

The unit die technique is not new. Detroit Mold has been making standard mold bases for plastic injection molding machines for years. It introduced its standard unit die assemblies for metal casters in January. The setup includes a pair of unit dieholders which are permanently positioned in the machine. Prehardened blank replacement insert plates are supplied so that a company can make its own mold cavities. The plates are clamped into the standard die holder assembly.

Louis J. DiSalle, company secretary, says his firm has been using the unit die on one machine since February. At present, the company is running zinc emergency brake handles for Ford's Thunderbird. Production is 270 an hour. Finished weight is 8.5 ounces. Rough weight is 29.7 ounces. Cycle time is 8 seconds.

• **Savings**—Mr. DiSalle lists these basic advantages: 1. Downtime is reduced. 2. Replacement costs are a third as much as they would be with conventional dies. 3. Replacement cavities permit multiple changes in the machine. DiSalle is running only a single cavity mold, although it can install a second cavity on the other side of the block when it's needed.

Some half dozen unit dies for metal machines are in use around the country, reports Folke Halward, the Detroit firm's chief research engineer. The DiSalle job is typical. Its dieholder includes a water cooled sprue bushing, sprue spreader, leader pins, and wedge clamps. Three sides of the die are open for easy installation of cores or coolant lines. The blocks are accurately located in the holder by a mill slot and pins and locked in position with wedge clamps.

A standard base size is 12 x 25 in. and costs $2500 to $3000. Standard 10 x 12 in. replacement blanks are available through Detroit Mold's distributors for about $250 a set.

put the small jobs on a

Lodge & Shipley

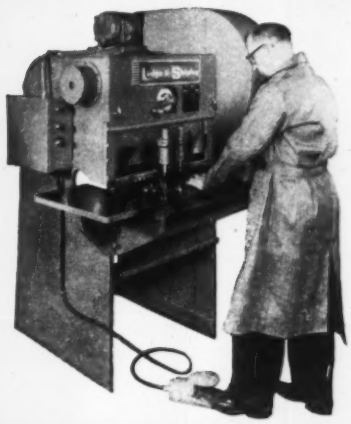
24" SPEED SHEAR

"Match the job to the equipment" . . . a simple rule for doing it faster and at lower cost . . . means you also free heavy duty shears for the jobs they do so well!

Particularly designed for fast cutting of small pieces, up to ⅛" x 24" mild steel, the Lodge & Shipley 24" Speed Shear is production proved for . . .

- Straight and Angle Shearing
- Sequence Shearing
- Slitting
- Blanking
- Notching
- Duplicating Straight Side Parts without Dies

The Speed Shear is "loaded" with features which speed and simplify set-up and operation. For time and money-saving details, please request Bulletin SS-1: The Lodge & Shipley Co., 3070 Colerain Ave., Cincinnati 25, Ohio



Lodge & Shipley

. . . your LODGE-ical choice

Stainless Steel Made Safer For Atomic Applications

The secret: Extremely low cobalt content. (It's held to less than 20 parts per million in a steel that normally has 500 to 2000 ppm.) Cobalt, an impurity that comes from the raw materials from which the steel is made, is unwanted because it may become radioactive in atomic equipment and endanger personnel

A SAFER stainless steel for atomic applications is now available.

It's safer because it has far less than the usual amount of cobalt in it.

Cobalt is unwanted in nuclear powerplants because it can become radioactive (cobalt 60) and pose serious problems of safety to personnel in maintenance and repair of equipment. It can also move out of the stainless and poison the nuclear system.

The maker is Universal-Cyclops Steel Corp., Bridgeville, Pa. To order this product, you ask for low, low cobalt stainless Type 304L. It is AISI Type 304L stainless with this refinement: Nearly all traces of cobalt are kept out of it.

• **Specifications**—AISI Type 304L is the American Iron & Steel Institute's designation for a very low carbon, chromium-nickel steel with general corrosion resistance similar to Type 304 but with superior resistance to intergranular corrosion following welding or stress relieving. Type 304L gets its intergranular corrosion resistance by having a low carbon content (not more than 0.03 per cent). The "L" following the three digits in the type number stands for low carbon. (Type 304 can have as much as 0.08 per cent carbon.)

Universal-Cyclops is using 304L for its low, low cobalt product because its corrosion resistance and good weldability make it desirable for use in atomic equipment.

The company holds the cobalt content to less than 0.002 per cent, but it can take it down as far as 0.0016 per cent.

Type 304L stainless ordinarily would have 0.05 to 0.2 per cent cobalt, or 500 to 2000 parts per million. The new product has less than 20 parts per million. It's also low in boron (less than 0.0005 per cent).

• **Process**—Universal-Cyclops won't go into the details of how it makes its new product, but the secret lies in using raw materials that have extremely small amounts of cobalt. The element is not furnace removed, so the raw materials must not contain more cobalt than the end product. Precautions even extend to the use of furnace linings that have no cobalt in them. Ladles and ingot molds also have to be free of any traces of it. The product can be made in either a vacuum induction furnace or an electric arc furnace.

• **It's Expensive**—Prices of 304L with cobalt held to less than 0.002 per cent are about seven times those for conventional 304L. Base prices per pound are: Forging billets, $3.71¾; sheets, $4.24¼; cold-rolled strip, $3.98; hot-rolled or cold-finished bars, $4.02¼; wire, in hot-rolled coils, or cold finished, $4.07¾; and plates, $4.13¼. With substantial demand for low, low cobalt stainless, the economies of volume production might permit price reductions of 30 to 40 per cent.

Material with larger amounts of cobalt (up to 0.05 per cent) carries lower prices, but not as low as

(*Please turn to Page* 118)

TWO INGOTS ARE POURED AT THE SAME TIME from this 400 ton ladle, in a large eastern steel plant. It's equipped with two Autopours, made by Blaw-Knox Co., Pittsburgh. The electrically controlled, hydraulic pouring attachments cut teeming time in half, and permit pouring from a remote position

54" HOT STRIP MILL

by Pittsburgh

featuring **DIRECT DRIVE** *to* **ALL SIX STANDS**

For the first time anywhere a 54" hot strip mill with direct drive to all mill stands has been built at the Portsmouth plant of Detroit Steel Corporation. This design eliminates the conventional large gear drive which is expensive to install, costly to maintain, less efficient in operation, and requires more space. Pittsburgh Engineering and Machine Division designed, fabricated and erected this entire mill with its many outstanding features.

We invite your inquiries for all types of rolling mills and auxiliary equipment.

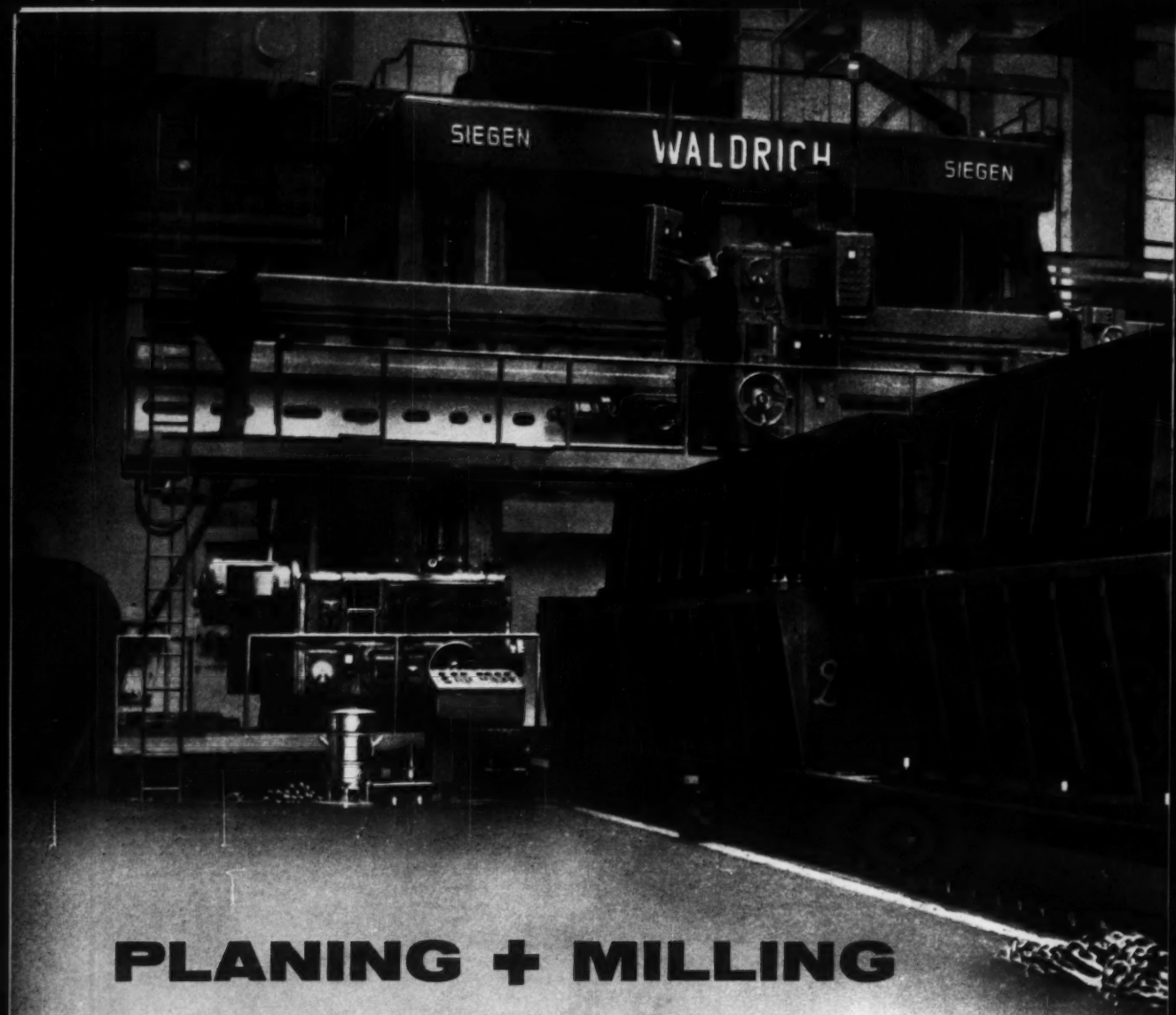
"Electric and open hearth steel castings from 1 lb. to 100 tons"

Pittsburgh ENGINEERING & MACHINE DIV.

Division of Pittsburgh Steel Foundry Corporation

P. O. BOX 986, PITTSBURGH 30, PENNSYLVANIA

PLANT AT GLASSPORT, PENNSYLVANIA



PLANING + MILLING

of Heavy Workpieces in one set-up . . . on one machine

- Reduces machining time
- Reduces set-up time
- Increases over-all accuracy
- Cuts manufacturing costs

Write for details

Waldrich Siegen combined planing and milling machines

WALDRICH SIEGEN

american waldrich mfg. corp.

1232 PENN AVENUE, PITTSBURGH 22, PENNSYLVANIA

this 140-TON horizontal milling machine

There's never been one like it before!

Just a press of a button puts this mighty Schiess into action. A 25-ft. high column moves smoothly along 45-ft. long bedways. Never a vibration—no chatter—even at maximum transversal loads! The new Schiess design of the spindle heads has eliminated this!

THE MILLING OPERATION. A huge tungsten-carbide cutter in a 14¼" spindle goes to work on the stock. And performs its operation with a consistent accuracy—a surface-finish count—never before obtainable on such a big fellow.

THE BORING OPERATION. Another press of a button! Another spindle goes to work—bores a 79" depth in one cut—or a total depth of 118". Boring and milling spindles are provided with 36 speeds of which the top 12 are V-belt transmitted. Rapid traverse, feeds and manual controls of the two spindles are completely independent.

That this mighty machine has tremendous productive capacity is self-evident. And its productivity goes far beyond conventional milling and boring. Schiess attachments increase its scope to taper-milling, thread-cutting, copying and, in certain instances, copying in 3 dimensions. It's a time saver, too. Can go from feed to rapid traverse immediately, without complicated adjustments.

The Schiess Model FB 36/22.5 Horizontal Milling and Boring Machine is a product of Europe's largest builder of heavy machine tools. Parts and service are as close as Pittsburgh. An American Schiess Engineer will be happy to help you size up these heavy producers for your heavy production needs. Write for catalogs and complete specifications on all five FB models.

also bores and turns

Face milling entire side of 38' x 14' press frame on Schiess Model FB 36/22.5

SCHIESS

AMERICAN SCHIESS CORPORATION

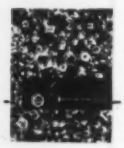
1232 Penn Avenue, Pittsburgh 22, Pa.

Fischer

has produced more than 2500 types of SPECIAL and odD Size precision nuts... including miniatures!

Let us quote your next order!

For details on Fischer *Turned* Brass and Aluminum Nuts, Send for catalog FS-1000.



Fischer Special Mfg. Co.
476 Morgan St.
Cincinnati 6, Ohio

Please send Catalog FS-1000 and Price Lists on Fischer Brass and Aluminum Nuts.

NAME_____ TITLE_____

COMPANY_____

STREET_____

CITY_____ ZONE_____ STATE_____

8429-FS

Fischer
SPECIAL MFG. CO.
476 MORGAN STREET
CINCINNATI 6, OHIO

TURNED NUTS — Fischer — SPECIAL MFG. CO. — CINCINNATI OHIO — SINCE 1905

STAINLESS STEEL . . .

prices for regular 304L.

Although the company has accomplished the low, low cobalt level with 304L only, it is believed that similar results can be obtained with other corrosion resistant grades.

• **A Question** — Universal-Cyclops has heard some theorizing that irradiation of stainless steel in nuclear equipment under some conditions may change nickel into cobalt. If that should be true, and a stainless without nickel is used, there should be no reason why it couldn't have its cobalt content restricted, says Universal-Cyclops. (Stainless steels without nickel are known as chromium grades and are usually designated as the 400 series.)

The cobalt which up to now has given concern is found as a trace element in the materials from which stainless is made, or with which they come into contact during processing.

In some instances, cobalt is a wanted element in steel and is added to it. For example: High speed tool steels, permanent magnet steels, and certain other specials.

But in stainless for atomic applications, cobalt is an impurity.

Steel Mills Favor Mercury Vapor for Exterior Lights

Over 60 per cent of the steel mills have changed over to mercury vapor lamps for outdoor illumination requirements, says Pyle-National Co., Chicago.

Why? Mercury vapor lamps give 2½ times more illumination per watt, greater diffusion of light, and require less maintenance. Life is up to seven times longer than with other types.

Heavy duty weather resistance is provided by enclosing the lamp in a cast aluminum projector. This directional beam unit is being used for roadways, parking areas, blast furnace areas, coke ovens, and highlines.

Pyle-National first adapted the mercury vapor lamp to a projector type fixture in 1955. The changeover started two years ago when mills recognized the economical features of the new product.

STEEL PIPE BY WHEELING

Dependable carrier of water!

Water, to be useful, must be moved to where it's needed. And you can't find a better, more dependable carrier than Wheeling Steel Pipe. That's because Wheeling Pipe has the dimensional stability and inherent strength needed for this and countless other jobs.

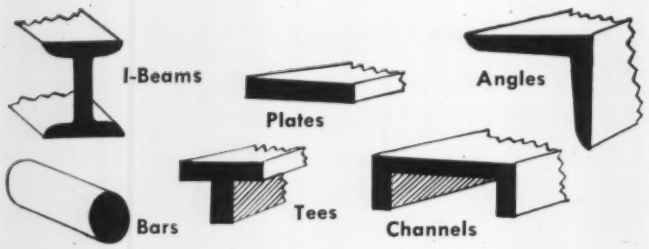
Now, Wheeling service and Wheeling Pipe are better than ever! For Wheeling has just completed a $5½-million program to expand and improve its pipe making, warehousing and shipping facilities.

Get the complete story on the many advantages of Wheeling Continuous Weld Steel Pipe, both black and galvanized. See your Wheeling representative, or write Wheeling Steel Corporation, Wheeling, W. Va.

Why Wheeling Steel Pipe is First Choice!

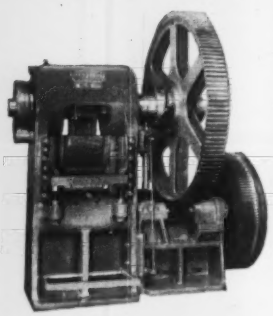
- Lowest cost with durability
- Strength unexcelled for safety
- Formable — bends readily
- Weldable — easily, strongly
- Threads smoothly, cleanly
- Sound joints, welded or coupled
- Grades, finishes for all purposes
- Available everywhere from stock

WHEELING STEEL CORPORATION · IT'S WHEELING STEEL! *District Sales Offices at Atlanta, Boston, Buffalo, Chicago, Cincinnati, Cleveland, Detroit, Houston, New York, Philadelphia, St. Louis, San Francisco, Wheeling*

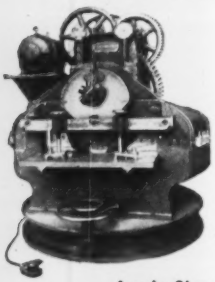


If you bend, roll, shear, punch, plane or straighten any of these shapes of metal— save time and money with

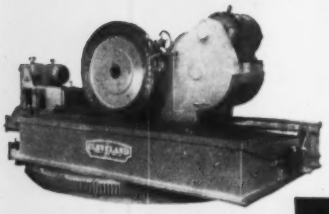
CLEVELAND
FABRICATING TOOLS



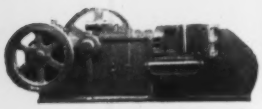
Bar Shears



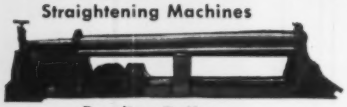
Angle Shears



Rotary Planers



Bending and Straightening Machines



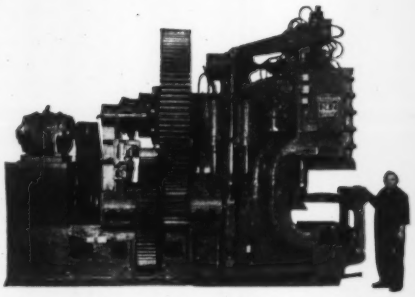
Bending Rolls

Simple to operate, ruggedly built, Cleveland Fabricating Tools are designed for efficient, trouble-free operation and years of service.

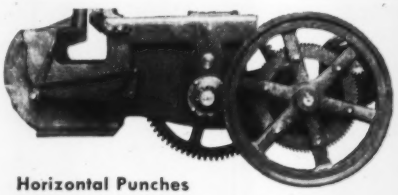
Leading shipyards, railroads, bridge builders, boiler makers, and other structural steel and heavy plate fabricators have proven the dependable, economical performance of Cleveland Fabricating Tools.

Since 1880, Cleveland has engineered its complete line of fabricating tools to be the finest, most efficient for punching, shearing, bending, rolling, straightening, planing, coping and notching I-beams, tees, zees, channels, bars, rods and other structural shapes.

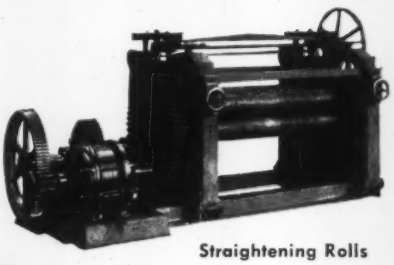
Write for Folder FT48 to help you determine the correct fabricating tool for your needs. AA-7494



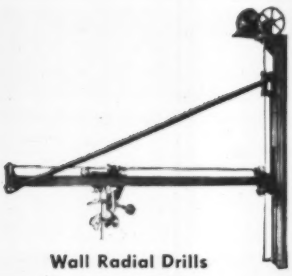
Vertical Open Gap Punching Machines



Horizontal Punches



Straightening Rolls



Wall Radial Drills

THE CLEVELAND PUNCH & SHEAR WORKS CO.
Established 1880

Power Presses
Fabricating Tools
Punching Tools & Dies

E. 40th and St. Clair Avenue, Cleveland 14, Ohio

Offices
NEW YORK
DETROIT
CHICAGO
PHILADELPHIA
EAST LANSING
CINCINNATI

Method Ups Output Of Zone Refining

New technique permits floating zone principle to be applied to larger pieces of material. Use of specially shaped cross sections makes it possible to treat thinner stock

LARGER volumes of material can be zone refined with new techniques developed at Bell Telephone Laboratories, New York.

Refining of metals in sheets and tubes is expected to increase the zone cross section five to ten times and permit purification of stock only a few mils thick.

• Thinner stock melts faster. Larger cross sectional area is obtained by forming material in special shapes.

Flat plates and tubes of the material to be purified provide a thinner melting zone. They melt through more rapidly than rod or bar stock. Increasing the width of a sheet, or the diameter of a tube, increases the cross section of the treated zone.

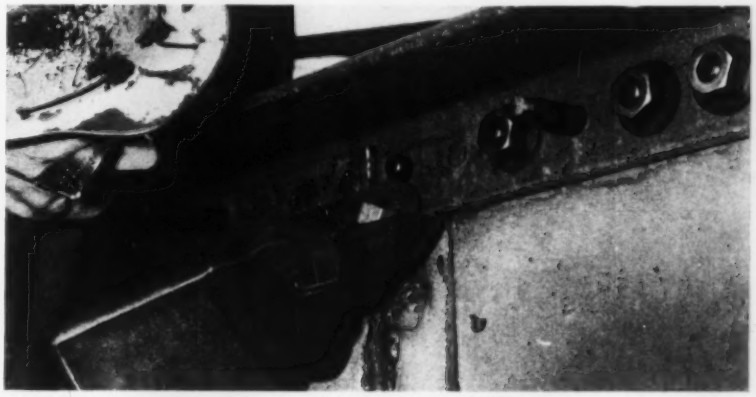
Molten zones in the sheets and tubes are more stable than in solid rods, the inventors say. The method has been used to purify silicon, iron, tin, gold, lead, bismuth, and water.

• The floating zone technique is useful in purifying reactive metals and semiconductors because molten material doesn't touch a container.

In zone refining, a rod or other piece of material is held vertically while heat is applied. A portion, or zone, of molten material held in place within the original shape by surface tension, is made to move along the piece, taking impurities with it. The end of the piece, containing the impurities, is cut off.

• Until now, the principle has been used to purify only small pieces of material.

For any material, the molten zone, supported by surface tension, can be only so high. Small diameter rods melt through easily; in larger ones, height of the zone becomes too great, and surface tension can't support the weight of the molten material.



When holes in the structural members have been reamed and aligned, high strength bolts are installed; they're tightened with a pneumatic torque wrench

High Strength Bolts Make High Quality Repairs

When they're tightened to recommended torque, they won't loosen, even under stresses applied by heavy machinery; they require a minimum of installation time

ARE your buildings being pulled apart by stresses from overhead cranes or other heavy machinery? One possible solution is to refasten structural members with high strength steel bolts.

They make joints stay put at Bethlehem Steel Co. plants in Lehigh and Bethlehem, Pa.

• **Stresses Destructive** — Structural members in steelworks are subjected to severe stresses by heavy tonnage bridge cranes and trolleys serving open hearths, soaking pits, and other areas in the hot metal departments.

Lateral stresses, estimated at 25 per cent more than the weight of the crane and its load, are applied to structural column heads when a crane stops or starts.

• **Bolts Help**—In the soaking pit building at the Lehigh plant, built in 1912, two, 10 ton bridge cranes have been in continuous operation. The crane runways and roof truss structure are supported by 28 columns. Joints, inspected frequently, often had to be repaired.

In 1953, new diaphragms were installed at the column head connections. The joints were secured with $\frac{7}{8}$ in., high strength steel bolts. Since their installation, the bolts have been inspected once a year. They haven't loosened in five years of service, in spite of the installation of two new bridge cranes in 1956. Each weighs 150 tons.

• **Installation**—In addition to good holding power, bolts offer savings in installation time. Two men ream and align bolt holes, inserting bolts needed to hold the members temporarily. Two other men install the remaining bolts, then tighten all nuts to the specified torque.

A calibrated, pneumatic torque wrench is used to tighten bolts up to $\frac{7}{8}$ in. diameter. The wrench is checked for accuracy before each day's work. Larger bolts are tightened with an impact wrench.

Contoured Grinding Wheels Tackle Rod Mill Rolls

Steel industry spokesmen say that crush-dressed grinding can cut their machining times by as much as 75 per cent. Also, harder rolls will insure better life

LOOKING for ways to broaden the market for their products, engineers at Sheffield Corp., Dayton, Ohio, turned up a dandy in the steel industry.

The job: Put the multiple grooves (called passes) in the rolls used to produce steel rods.

Sheffield's answer: Do the machining job with a crush-dressed grinding wheel. It may save up to 75 per cent of the machining time and give a good boost to roll life.

• **"I can't see any reason why this won't become the standard way to machine rod mill rolls."**

A mill superintendent made that statement to STEEL. He was one of the more than 60 steel industry representatives attending a demonstration at Dayton. As he spoke, he was watching a grinding wheel plunge into a No. 5 rod mill finishing roll. Semicircular grooves were being ground into the roll periphery, eight at a time.

Time to complete eight passes: 15 minutes. It takes only 70 minutes to grind all 32 passes on the roll.

Present mill practice is to form the passes on a lathe, feeding the cutters into the roll. The feed often is manual. Some mills also use contouring lathes.

The surface of this grinding wheel is formed to plunge eight grooves into the roll periphery. Total cycle time for the 32 grooves is about 70 minutes, including shifting of the worktable

The mill superintendent told STEEL he normally would do the job with cutters and that it would take him three to four times as long to produce the roll as the grinder would take.

• **A big benefit may come in terms of increased roll life.**

The roll ground at the demonstration had a hardness of 84 to 86 Shore (roughly 62 Rockwell C). That's some 10 points harder than conventional rolls, kept relatively soft so they can be cut.

What will this mean to roll life? For sure, it will mean an increase. One expert estimated he could get twice the life from the harder rolls.

• **The grinding method also bids fair to speed up roll redressing.**

To redress the 32 passes by removing 1/16-in. metal from the roll generally would take 3 to 4½ hours on a lathe. With the grinding process, it takes only 40 minutes.

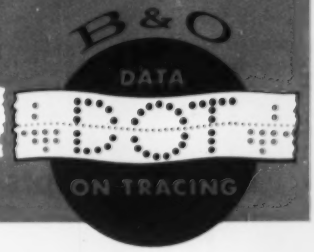
The contour for the grinding wheel is put on by a high speed steel or a carbide roll that has the same profile as that desired on the workpiece. The roll is fed into the wheel periphery, literally crushing the surface into shape.

Then the wheel is fed into the roll at about 0.008 in. a minute. The feed is reduced to 0.004 in. a minute for the last 0.025 in. of travel.

After a prescribed number of passes have been ground, the machine automatically stops and the wheel is redressed by the crusher roll. This keeps the grinding wheel in shape and assures accurate tolerances on the workpieces. On the demonstration job, center distance between passes was held to ±0.00025, and the radiuses of the individual passes were held to ±0.0005 in.

Here's the Newest

B&O service that can make you a better informed shipper!



Fast... Fast... Fast tracing information is now available to shippers and receivers, thanks to B&O's new... DOT... (Data On Tracing). Through ultra modern methods, B&O sales and service offices across the Nation are kept informed of car movements 24 hours a day.

Ship via B&O and get the benefit of... DOT...

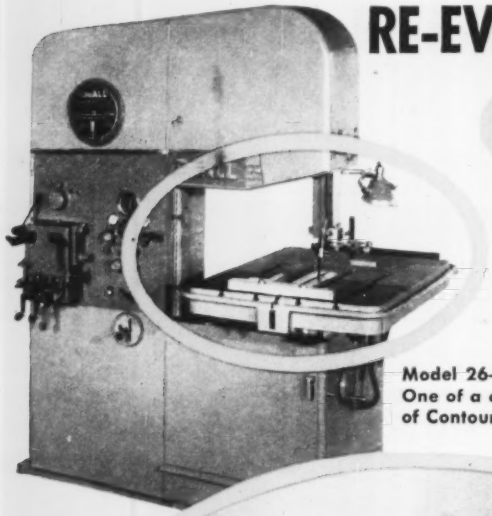
Ask our man!

B&O BALTIMORE & OHIO RAILROAD

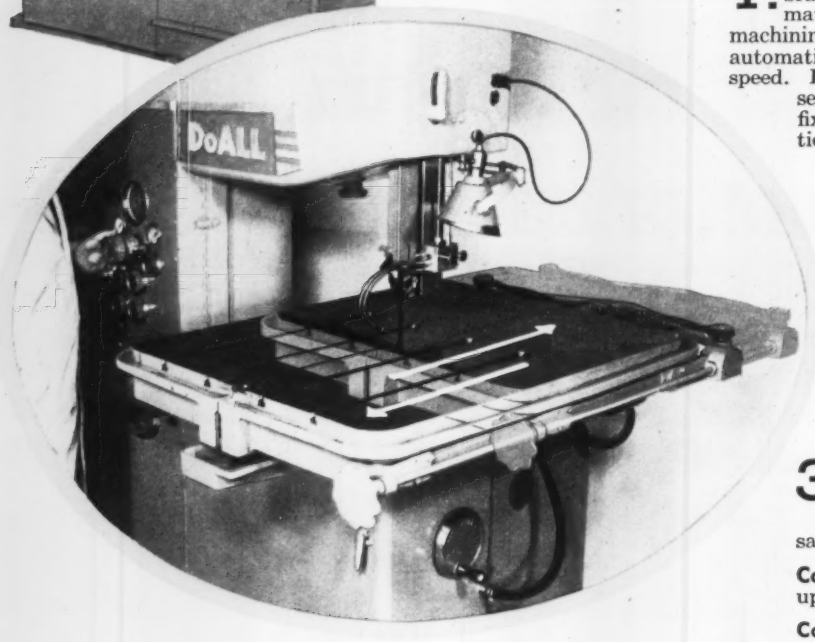
The line of SENTINEL Service—TIME SAVER Service—TOFCEE Service

RE-EVALUATE your BAND SAWING

SEE Contour-matic® MACHINES



Model 26-3
One of a complete series
of Contour-matics



1. New Power Work Table with calibrated work fixture on the Contour-matic removes the labor from band machining. Smooth-operating controls automatically coordinate feed and tool speed. Result: band sawing becomes semiautomatic with little or no fixturing for toolroom or production runs.

2. New Cutting Tool is the high-speed steel Demon* saw band. Its phenomenal properties permit performance that is 30 times longer than ordinary carbon steel blades. Tooth sharpness is retained at high temperatures, thus permitting heavy feeds at higher tool velocities to give maximum cutting rates and tool life.

3. New Cutting Rates—up 650%.

Accuracy—held within thousandths.

Capacity—table feeds heavy work up to 1,000 lb.

Coolant—mist or flood for extended tool life at maximum sawing rates.

New Concepts of Band Machining Economy and Versatility

Contour-matic band machines are different. There is nothing else like them in the machining world. For machine tool replacements or additions, Contour-matics open new possibilities for the reducing of machining costs.

It is the choice of production personnel and methods engineers who have evaluated the band machining method. They find Contour-matics are their best machine tool investment.

Do what others are doing—question your band sawing and other machining methods by asking, "Can it be done on a Contour-matic?" Just call your local DoALL store for a free demonstration right in your own plant . . . or write.

B-56

FREE—"Job Spotting" Service

For your evaluation—
illustrated case histories of job savings made by the Contour-matics over former methods will be mailed to you periodically. Send us your name on company letterhead.

Reg. T. M. The DoALL Company

THIS IS A
TYPICAL DoALL STORE

The DoALL Company, Des Plaines, Illinois

Call Your DoALL Service-Store

Lubrication Control Ups Profit Potential

Stamper has cut number of lubes stocked, installed centralized grease distribution system

SIMPLIFIED practices have slashed lubrication costs 51 per cent and reduced inventory 30 per cent at the Stamping Div. of Rockwell-Standard Corp., Utica, N. Y.

The program was instituted as a result of studies made for the division by the technical advisory service of Gulf Oil Corp., Pittsburgh. Benefits include less waste, conservation of storage space, and simplified inventory control.

Use of different types of special oils has been discontinued where a single lubricant will do a satisfactory job.

• **Centralized System** — Another major source of saving is the Stamping Div.'s centralized grease distribution system which serves more than 1300 lubricating points on the firm's many stamping presses.

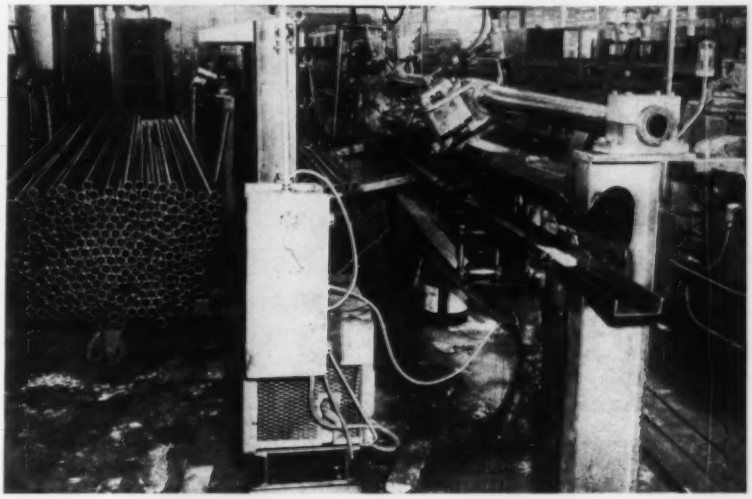
Lubricating was formerly a manual operation. With each outlet requiring individual attention on a regular basis, two oilers were kept busy full time.

A single lubricant (Gulf XXX) having extreme pressure properties that protect against the heavy shock loads of stamping operations is used in the system.

• **Improves Profit Potential**—Even more important in its relationship to profits, is the improved operating performance that has resulted from the combination of controlled inventory and centralized lubrication.

Downtime has been reduced, which in turn has improved the profit potential of the plant in turning out high quality, metal stampings of simple and complex design.

The Stamping Div. has 1800 pieces of standing equipment. It produces stampings for air conditioning units, milking equipment, beverage cooling and refrigerating equipment, gas meters, washing machines, power lawn mowers, concrete mixers, automotive and aircraft equipment, and many other consumer and industrial items.



Manufacturer of exhaust pipes, breather tubes, and similar tubular products receives benefits from use of 'right' cutoff and loading equipment

'Right' Machines Boost Output, Cut Labor Costs

Four men and two cutoff saws were replaced with one man and three automatic cutoff lathes and loading tables. Equipment paid for itself in less than three years

YOU can often increase your output and reduce your labor requirements by putting the right equipment on a job.

Threefold benefits were realized by the replacement of two cutoff saws for tubing with three automatic cutoff lathes and loading tables at Falls Steel Tube & Mfg. Co., Newton Falls, Ohio.

1. Production has increased 50 per cent.
2. One man is doing the work that formerly took four.
3. The equipment paid for itself in less than three years.

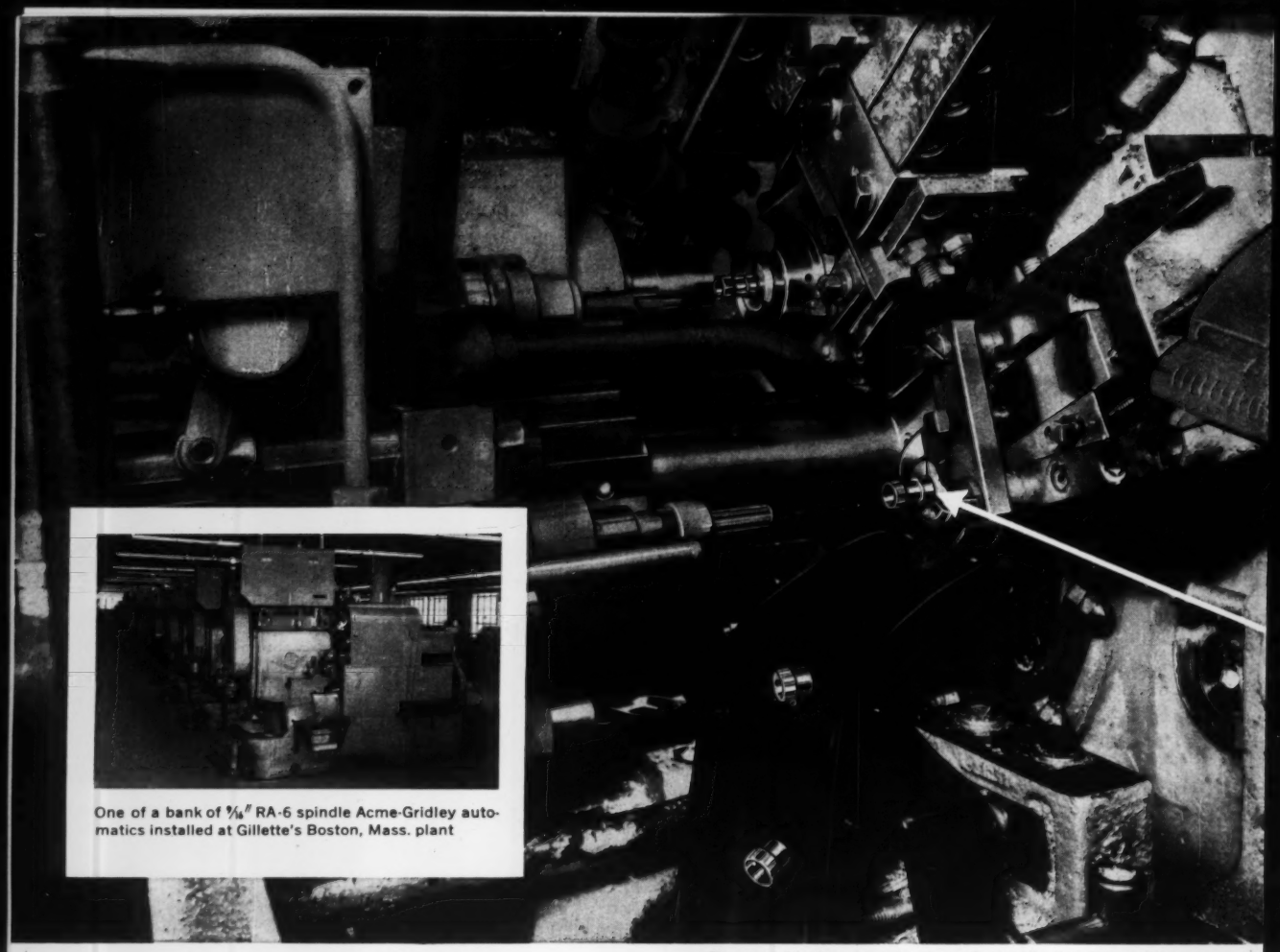
• **Case History**—Falls Steel manufactures tubular automotive parts. Manufacture starts with 48 in. wide, 14 to 20 gage strip. The 1010, cold-rolled material is slit to the desired width and recoiled. Forming and welding take place on two tube mills.

• **Before**—Before the new cost saving techniques were adopted, tubing was manually fed into two cutoff saws. Each saw required two men —one for loading and one for cutting. Cut pieces were manually stacked on tote trucks.

• **After**—Three years ago, the saws were replaced by the automatic cutoff lathes and loading tables. (The maker: Bardons & Oliver Inc., Cleveland.) Tubing is automatically transferred from the tube mills to the cutoff loading tables, then to lathes.

A transfer device then takes the cut lengths and stacks them on tote trucks. Swaging follows, with the tubing being sized and deburred. One operator runs all three machines. Tube diameters run ½ to 3 in.; lengths 6 to 120 in.

Increased productivity of the lathes has allowed greater utilization of tube mills, swaging, bending, welding, and other finishing facilities.



One of a bank of 7/16" RA-6 spindle Acme-Gridley automatics installed at Gillette's Boston, Mass. plant

Close up of tooling zone showing adjusting knob in 5th position

Precisely Formed, Marked, Knurled,

Broached, Micro-finished, Reamed and Tapped . . .

ON ONE ACME-GRIDLEY AUTOMATIC

in *4½ Seconds!*

The adjusting knob on this new adjustable razor is but one of its several precision components made by The Gillette Safety Razor Company on 7/16" Acme-Gridley six spindle bar automatics. The requirements were extremely exacting, *with as many operations as possible performed in the primary setup!*

For example: nine positions are stenciled on a turned portion of the O. D. with interrupted knurling held in exact peripheral location to the marking. In addition, close tolerance hole sizes are involved and *all* external burrs completely removed. All tools had to be synchronized to produce the exacting number-knurl relationship on the periphery.

Working in close cooperation with Gillette engineers, National Acme specialists took full advantage of the wide-open tooling zone, independently operated tool slides and the extreme accuracy and flexibility of direct camming . . . to perform an ingenious job of tooling. Many operations normally considered "secondary" were accomplished in the primary setup. Costly rehandling and "second machine investments" were reduced.

Write or ask one of our representatives for the complete story on the industry's most modern approach to *your* cost reduction problem.

Pioneer in Circumferential Automation

National Acme

The National Acme Company
189 E. 131st Street
Cleveland 8, Ohio

Sales Offices: Newark 2, N.J.; Chicago 6, Ill.; Detroit 27, Mich.

Standard Drill Holds the Cost Line

Unit costs are competitive with those attained on mass production equipment. In this case, versatility is the key; 22 different parts have to be run

ONE standard multispindle machine drills and reams 22 different starter-motor commutator end frames at costs usually associated with single purpose production machinery. This is true even though machining is often done in less than 100-part lots.

Diverse production is necessary at Delco-Remy Div., General Motors Corp., Anderson, Ind., which not only mass produces standard automotive starter motors, but also turns out small quantities of special motors for some engines.

• **The Machine** — Drilling and reaming are handled on a standard Natco H-6 multiple-spindle drilling machine. Costs of the small-lot parts are kept competitive with those mass produced.

Even though hole size and location vary, shifting production from one part run to another requires only a quick and simple change of cutting tools. Quality standards have exceeded requirements.

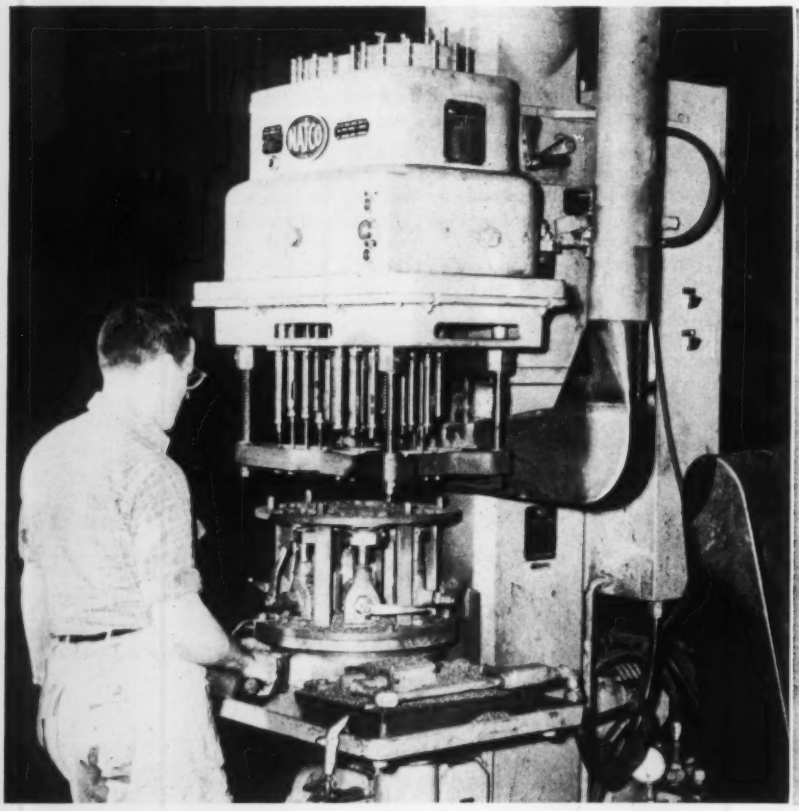
The machine has 24 universal spindle drives, with a slip spindle plate bored for 44 locations, the number required for all of the different hole patterns.

• **Cycling**—All of the different end frames can be held in one six-position fixture, mounted on the 18-in. diameter index table.

The machine will not cycle until the indexed operation is completed. On production runs, the operator simply loads and unloads the fixture, while the machine performs all other operations automatically.

The machine can be adapted to other products through installation of different slip spindle plates.

This multiple-spindle machine, with its six-position fixture, drills and reams a variety of commutator end frames. Two of the frame types are shown at right



Special Machine Shows Cost Advantage

Production requirements are not high, but a study proves that the special machine is more economical than two other standard-machine methods on this job

WHEN does the relatively higher cost of special machinery pay off, and when does it pay to stick with the standard machines?

Here's how one such problem was approached at the Aircraft Engine Div., Ford Motor Co., Chicago.

Parts are J57 jet engine diffusers. Production necessitates 92 drilling, reaming, and tapping operations. Based on a schedule of 165 units a month, what is the least expensive method?

In addition to the cost of facilities, floor space, and manhours, manufacturing engineers had to consider flexibility so that engineering changes affecting radial movement and dimensions, and sudden increases in schedules, could be handled.

• **Three Choices** — Careful study was given to three suggested methods.

The first was based on the use of a precision boring mill and three radial drills. Time per part was calculated at 9.8 manhours.

The second made use of four radial drills, together with some indexing fixtures. Time per part would be 5.5 manhours.

The third would employ a specially built automatic index machine on which parts could be completed at the rate of 2 manhours each.

• **The Winner** — In selecting the production method, engineers compared costs over a three year period. They calculated that the special machine would save more than $270,000 and 528 sq ft of floor space when compared with the first proposal.

The special also would save an estimated $149,000 and 528 sq ft of floor space when compared with the second proposal.

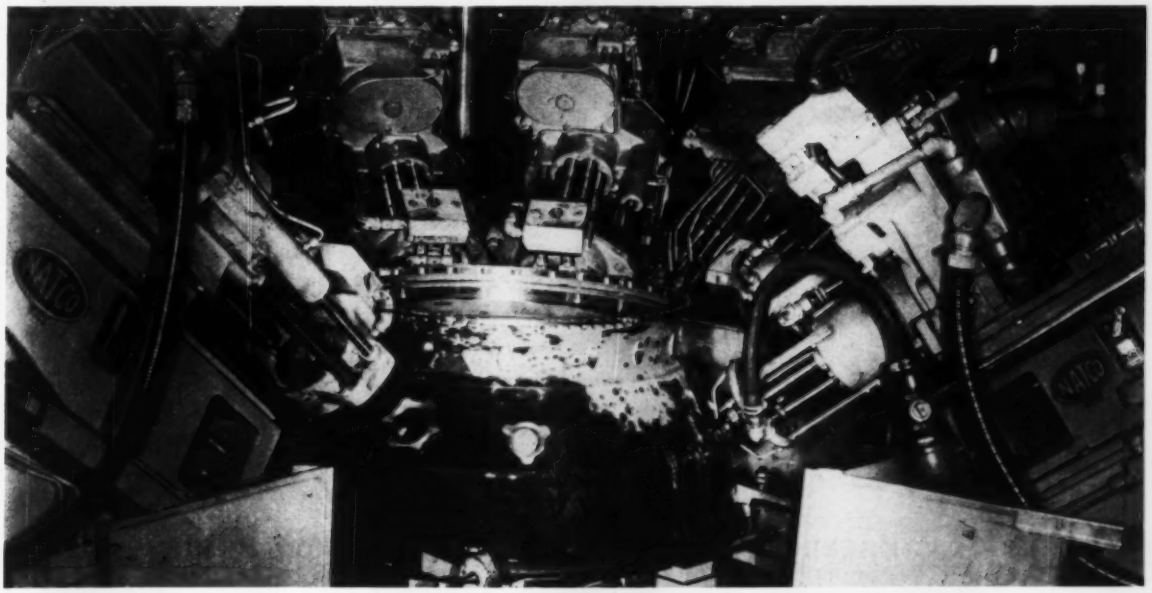
• **In Production**—The selected machine incorporates nine units around an 18-position index table that is 48 in. across. It was built by National Automatic Tool Co. Inc., Richmond, Ind.

Six of the units have change-gear drill heads, two have six spindles and four have three spindles. Two of the three-spindle units include auxiliary heads arranged for two-position indexing.

The remaining three stations are special traversing tapping units with automatic time delay, reverse, and positive stop.

The machine is built with standard "building block" components, so changes can be made at a minimum of cost and downtime.

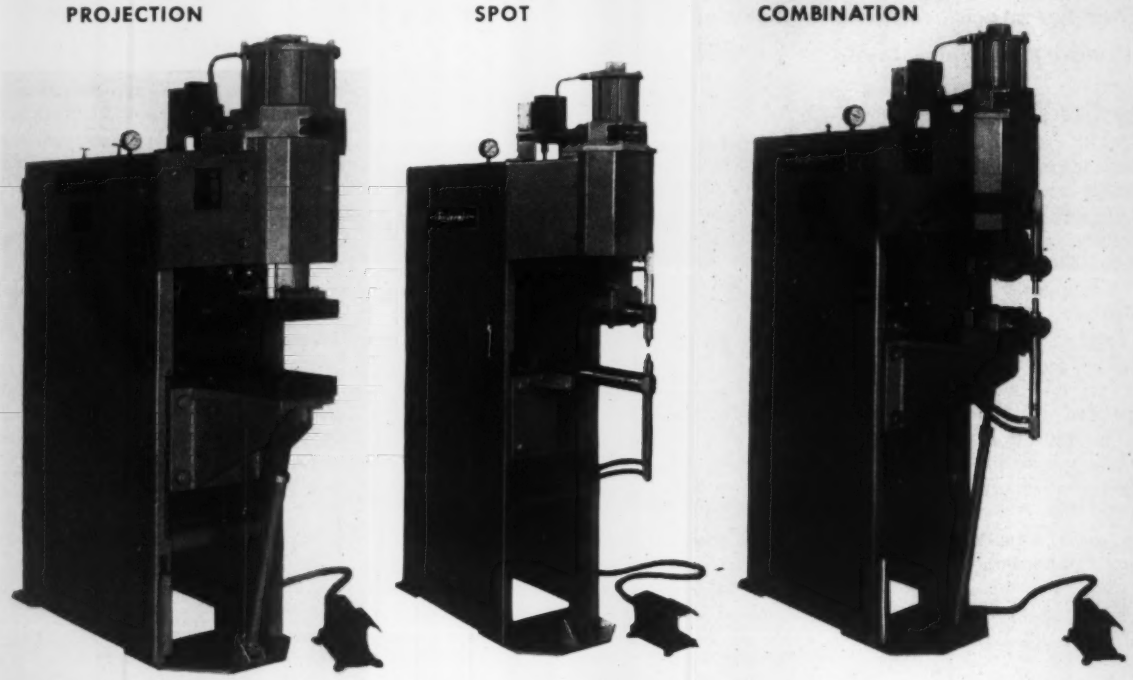
This nine-way index machine processes 92 drilling, reaming, and tapping operations on jet engine diffusers. Production time of 2 manhours per part helped in outbidding standard units



Introducing...

FEDERAL'S NEW TRIM-LINE PRESS WELDERS

PROJECTION SPOT COMBINATION



Available from stock in four sizes in capacities of 30 to 500 K.V.A.

Completely new . . . these advanced design trim-line press welders will give you maximum production in a minimum floor area. What's more their compact, simplified design assures easier operation, less maintenance and ready accessibility.

Designed and built by Federal, one of the largest and most experienced resistance welder manufacturers, these new welders are available from stock as spot welders with horns, projection welders with platens, or combination spot and projection welders. Each type is available in a full range of standard throat depths, welding forces and transformer sizes.

Many standard automatic welding attachments are available to increase production with these standard machines.

Listed below are some of the features. For more information get in touch with the Federal representative nearest you. Ask for Bulletin P-59 and Special Tooling Bulletin AWA-59.

COMPLETELY ALL NEW DESIGN FEATURING:

- **New One Piece Frame** . . . stronger, less floor area, greater accessibility.
- **New Anti-Friction Slide** . . . hardened and ground slideweighs —eight anti-friction roller mount gives maximum stability —permanently lubricated rollers—simple adjustment.
- **New Steel and Copper Lower Arm** . . . minimum deflection—easier to adapt for special tooling.
- **Stock Models** . . . all components built for stock, quick delivery.
- **No Price Increase** . . . superior design at low cost.

Federal / Warco

THE FEDERAL MACHINE AND WELDER CO. • WARREN, OHIO

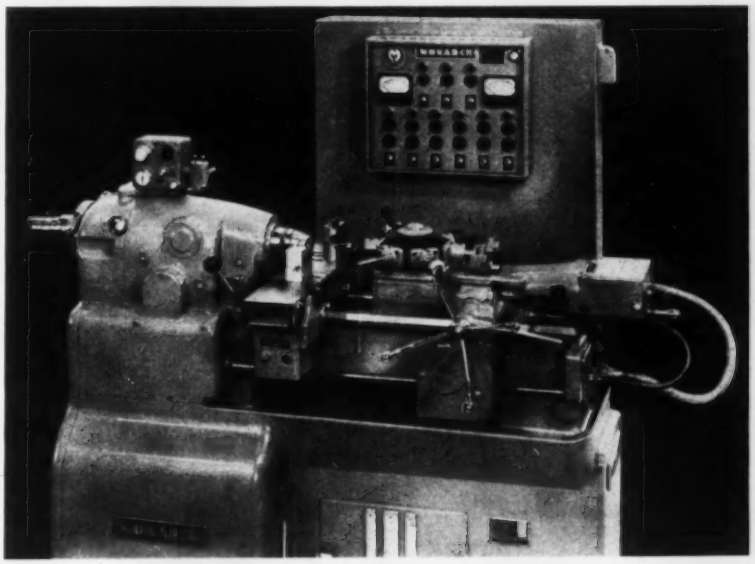
AFFILIATED WITH BERKELEY-DAVIS, INC., DANVILLE, ILLINOIS, MANUFACTURERS OF AUTOMATIC ARC WELDING EQUIPMENT

Electronic Controls Speed Screw Machine Work

HIGHER output and greater accuracy with less operator effort are performance characteristics cited for the Speedi-Matic, a hand screw machine recommended for lots ranging from less than 25 to more than 2500 pieces.

It features simplified electronic controls and a hydraulically powered turret. The control center provides preselected, automatic speed and feed change. A separate speed may be preset for each of the six turret positions (including a reverse speed for tap withdrawal) and for each of the two cutoff and forming slide positions.

Also included in the control center are a feed indicator, a dual rpm and sfpm indicator, and a work diameter selector. The indicators enable the operator to quickly select the correct speed and feed for each work station. The work diameter selector provides the ideal surface cutting speed without calculations. Setup is so simple that the time can be regained during production.



Drive to the spindle is from a 5 hp, direct current motor. It is gearless, stepless, and infinitely variable in forward or reverse. Acceleration to 4000 rpm requires only 2 seconds; braking to a stop, only 1½ seconds.

For more information, *write* Monarch Machine Tool Co., Sidney, Ohio.

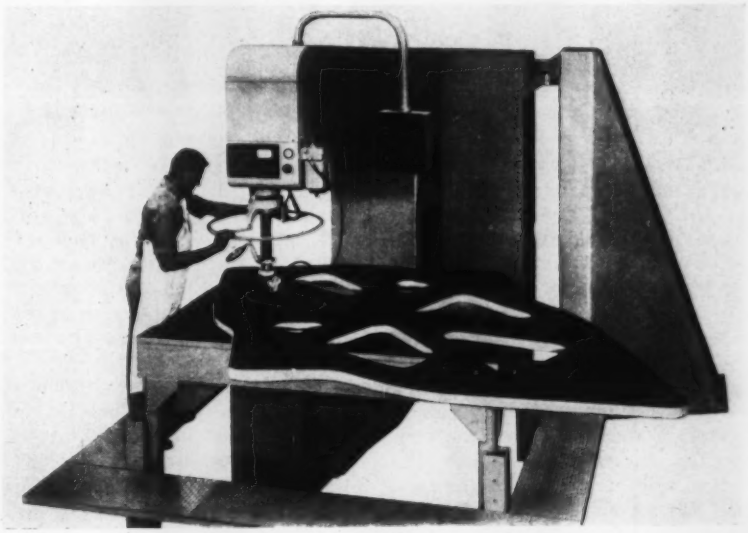
Articulated Bandsaw Handles Large Workpieces

LARGE, hard to handle workpieces remain stationary on the Pan-Am Model 5, the cutting tool moving to do the job easily.

A sweeping head, double hinge, and link construction provide over 99 sq ft of unlimited cutting area, and continuous straight-cut length of 17½ ft.

Parts can be machined from the solid more quickly than procuring rough castings or forgings, and at less expense, says the builder.

A convenient cutoff method is provided for heavy tubing, plates, and structural shapes: The operator steers the cutting head with a wheel attached to the upper saw guide or with an optional remote control unit. For rapid positioning, an air cylin-



der retracts the feed wheel and then the cutting head swings freely.

The unit has two groups of controls, a fixed group for setup, and a movable group for operation. The fixed controls are on the cutting head. The operational controls are in a portable unit, attached to the machine by a patch cord. Control can be from a closed-circuit television control console, a remote control station, or a pendant.

For more information, *write* DoAll Co., Des Plaines, Ill.

Records Ultrasonic Tests

PERMANENT records of ultrasonic bond testing and flaw detection can be made with the Soltronics Sonafax system.

It can be used with ultrasonic inspection of brazed joints and adhesive bonded structures. Excellent sensitivity and definition are obtained from tests of facing sheets to core bond in brazed honeycomb.

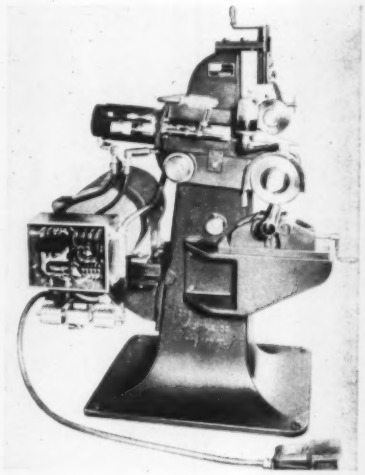
With the system, 1:1 scale recordings can be made of areas 18 in. wide and of indefinite length. For more information, *write* Ultrasonic Testing & Research Laboratory, 14710 Raymer St., Van Nuys, Calif.

Tube Cutoff Machines Have Hydraulic Checks

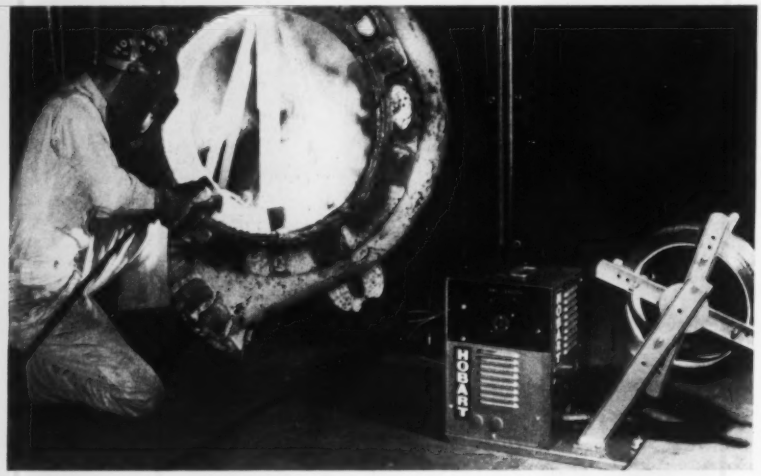
USERS of 1959 models of the Continental rotary pipe and tube cutoff machines can expect increased production rates and lower cost per cut length of pipe, says the manufacturer.

The machines are designed to fit the needs of fabricators who process tubing from the lightest gage to heavy walled pipe up to 12¾ in. in diameter.

Built into the machines are hydraulic power checks which achieve smooth cutting strokes by keeping a uniformly regulated cutting pressure on the wheel and work. Other features include a fast wheel approach to the work, and a fast return to normal position.



For more information, *write* Continental Machine Co., 2345 W. Nelson St., Chicago 18, Ill.



Semiautomatic Welder Is Portable

READILY connected to almost any alternating or direct current welding machine, the Handomatic features a universal semiautomatic wire feeder designed for hardsurfacing, buildup, and mild steel welding using tubular (fabricated) or solid wire, open arc or submerged arc processes.

A single rheostat controls the wire speed.

Feed rolls, pressure rolls, and current tips are available for 5/64 and 3/32 in. solid hard wire, and 3/32 and 7/64 in. tubular wire. The unit is designed for continuous current up to 500 amperes using the flux type or open arc gun. The hopper holds 5 lb of flux.

The wire speed range, at nominal 30 volts, is 60 to 260 ipm; an optional gearbox provides 90 to 460 ipm at 30 volts.

For more information, *write* Hobart Bros. Co., Troy, Ohio.

Portable X-Ray Unit Does On-the-Job Work

POWERFUL enough to radiograph 1¼ in. of steel in 45 seconds, the Andrex 140KV x-ray unit is designed for on-the-job inspection by one man. It is useful in radiographing pipelines, pressure vessels, castings, aircraft, missiles, storage tanks and cars.

The x-ray system has two parts, a 50 lb generator and a 55 lb control (Range: 50 to 140,000 volts and 1 to 4 milliamperes).

For more information, *write* Picker X-Ray Corp., 23 S. Broadway, White Plains, N. Y.

Contour Cutting Unit Trims Pipe Joining Costs

UP TO 75 per cent of the time and material consumed in joining pipe and fabricated parts can be saved with the Steffan automatic contour cutting machine.

Initial setup takes as little as 15 seconds. Cutting at a rate of 20 ipm, a 6 in. aluminum pipe can be contoured in 20 seconds.

The pipe is clamped into a three-

WELDING CLINIC

J. Imperati and R. F. Pulver, Welding Engineers
The American Brass Company, Waterbury, Conn.

Give worn equipment a new lease on life by surfacing with Anaconda Welding Rod

Anaconda Welding Rods are widely used in production and maintenance operations in the manufacture of all types of mechanical equipment and consumer goods. Familiar uses are the joining of iron and steel parts by oxyacetylene braze welding and the oxyacetylene braze-welding repair of broken machine parts. Of equal importance is their value in overlaying iron and steel to reduce the friction of sliding surfaces, and in rebuilding worn surfaces to get continued usage from parts that would otherwise be scrapped. Anaconda-997 (Low Fuming) Bronze, Tobin-Bronze 481, and Nickel Silver-828 Welding Rods are useful for many such applications.

Oxyacetylene braze welding is employed for these surfacing and rebuilding operations because of its speed, efficiency, and the convenience of using the equipment and skills available in most job shops. The many advantages, which result from the low temperatures of application, include:

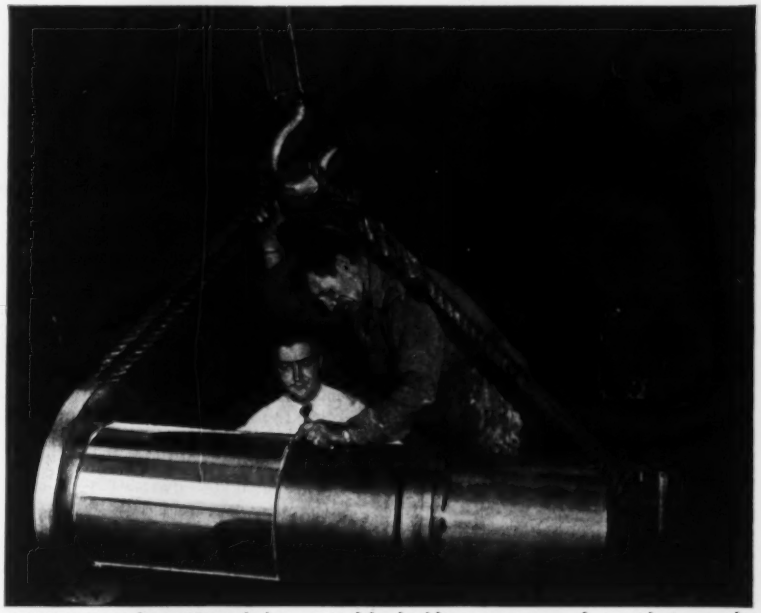
1. *Procedures which are virtually foolproof.* The molten bronze automatically tins out and fuses to the base metal when the latter reaches the proper temperature. The rate of heat input is low enough to permit excellent control of the weld metal, and deposits are easily built up even in the vertical position.

2. *Low residual stresses.* The overall heating that accompanies the process reduces temperature gradients and minimizes distortion.

3. *Economy in time* . . . frequently repair welds are made without dismantling equipment.

4. There is ***no embrittlement of*** cast iron due to high temperatures. Machinability is retained and cracking tendencies are eliminated.

5. *Absence of iron pick-up* in deposits made on iron and steel, thereby avoiding hard spots and cracks.



WORN SPINDLE for a 60-ton lathe repaired by building up worn surface with Anaconda Nickel Silver-828 Welding rod by oxyacetylene braze welding. The estimated saving over the cost of a new spindle was nearly $2500.

Surfacing operations which are regularly done with Anaconda Welding Rods include the overlaying of bearing surfaces on iron and steel, and the rebuilding of worn items such as pistons, shafts, valve mechanisms, gear teeth, bearing surfaces, propeller and impeller blades.

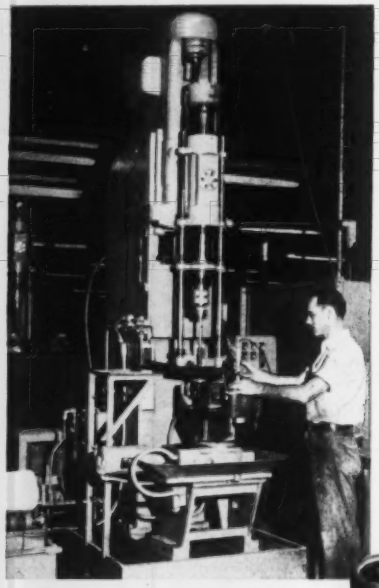
Details concerning the type of rod and procedures recommended for surfacing various metals are available in Publication B-13, "Anaconda Welding Rods."

Free technical assistance. In most cases, Anaconda distributors can help you select the exact rod you need for your job. But if you have special problems, Anaconda welding engineers are at your service. For a copy of Publication B-13 with comprehensive information on Anaconda Welding Rods and procedures — or for technical assistance — write: The American Brass Company, Waterbury 20, Conn. In Canada: Anaconda American Brass Ltd., New Toronto, Ont.

ANACONDA®
WELDING RODS
Made by
The American Brass Company

WHY Emerson Electric MICROHONES Laminated Steel Rotors

The Emerson Electric Manufacturing Company is constantly searching for the best possible processing methods. Working with Micromatic engineers on problems encountered in processing shaft holes in their laminated steel rotors, Emerson Electric found that Microhoning would provide much higher production quality while lowering processing costs. The following Microhoning benefits are now obtained:



Model 728 Hydrohoner with automatic Microsize, Microdial and two station rotary indexing fixture. Hole Tolerances: Diameter .0002 inch, straightness and roundness .0001 inch.

CUT REJECTS
With former processing method rejects ran too high. Microhoning controls size and assures a clean hole—rejects are substantially reduced.

ELIMINATED OPERATIONS
Old processing method required two operations. In one operation, Microhoning generates size and straightness within specified tolerances.

REDUCED BALANCING TIME 70%
To preclude vibration and poor operating characteristics, it is essential that shaft hole be concentric with O.D. of rotor. Microhoning reduced by 70% the amount of dynamic balancing correction required.

PROCESSING COSTS CUT 70%
Current figures show the cost of Microhoning shaft holes in rotors to be less than 30% of processing by old method.

Rotors (from 2¼ to 4 inches long) are all Microhoned on the same machine by changing adaptor in fixture and resetting stroke length.

Learn why Microhoning will give you efficient stock removal, closer tolerances, accurate alignment and functional surfaces.

☐ Please have a Micromatic Field Engineer call.
☐ Please send Micromatic literature and case histories.

NAME_____

TITLE_____

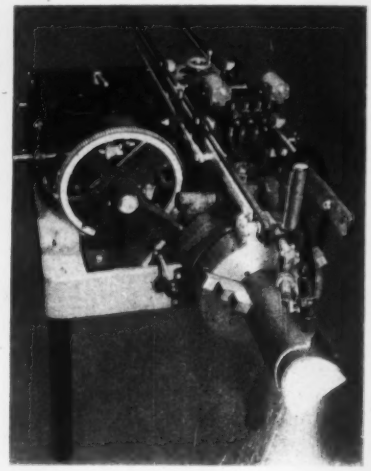
COMPANY_____

STREET_____

CITY_____ ZONE____ STATE_____ D

MICROMATIC HONE CORP.
8100 SCHOOLCRAFT AVENUE • DETROIT 38, MICHIGAN

NEW PRODUCTS and equipment



jaw chuck and pertinent information fed into the control mechanism. Complex contours are cut automatically without templates, layouts, or patterns.

Sections requiring straight, mitered, or contoured ends can be quickly prepared with proper bevels for welding. The cutting head has an oxyacetylene torch for cutting carbon steel or a Linde Heliarc for cutting aluminum, stainless steel, copper, cast iron, magnesium, and high alloy steels.

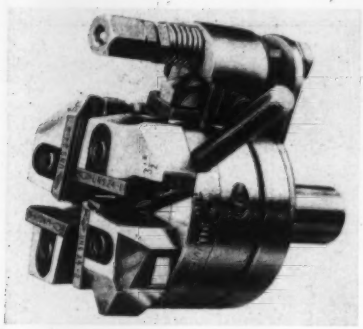
For more information, *write* Steffan Mfg. Corp., 276 S. Lincoln St., Salem, Ohio.

Threading Die Opened By Pulling or Pushing

AN AID in operation of automatic lathes, turret lathes, and other machines, the DE Landmatic threading die heads can be opened by either the pull-off (internal) or push-off (external) methods.

To get pull-off action, the forward travel of the machine slide is interrupted, allowing the die head to advance by the self-leading action of the chasers until the head opens. When using the push-off action, the trip mechanism contacts a stop on the machine to open the head.

The new dies are available in two sizes, the No. 4 which forms threads from a No. 4 to ½ in. diameter, and the No. 5 which forms



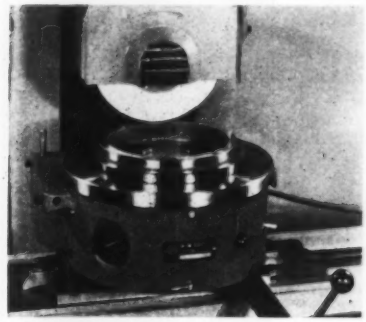
threads from a No. 4 to a $\frac{5}{8}$ in. diameter. Auxiliary equipment allows the No. 4 head to produce threads on diameters up to $\frac{3}{4}$ in. and the No. 5 up to 1 in.

For more information, *write* Landis Machine Co., Church and Fifth Streets, Waynesboro, Pa.

Motorized Table Makes Grinder into a Rotary

ANY SURFACE grinder can be converted into a rotary unit for rough or precision work. The Model R-710-V Roto-Grind motorized table makes it possible.

A variable speed transformer is provided to give the exact rotating speed in relation to the surface speed required in grinding. Extreme accuracy, up to 20 millionths of an inch, can be obtained on grinding a 10 in. diameter plate flat.



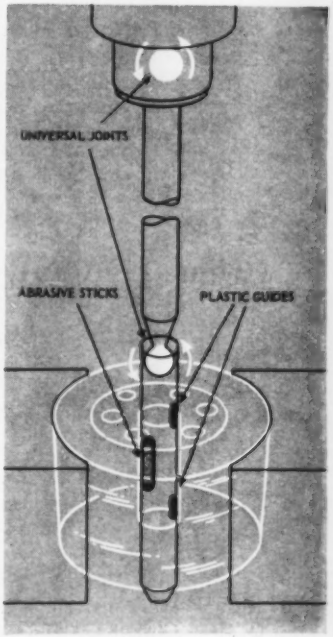
Roto-Grind fits on a jig grinder for removing material from large rings, offset holes, radiuses, and contours. It has a disengage clutch for hand operation and indicating purposes.

For more information, *write* M & M Tool & Mfg. Co., 1124 E. Third St., Dayton 2, Ohio.

HOW MICROHONING Laminated Rotors Cuts Processing Costs

Emerson Electric squirrel-cage rotors are made of special "electrical grade" steel laminations and each lamination is coated with oxide insulation. In processing the rotor, the O.D. is turned concentric with the shaft hole. Then, in one operation, Microhoning accurately generates finished size and straightness of shaft hole without any change in hole location.

The Micromold tool has two universal joints in the drive shaft which allow the tool body to align itself with the shaft hole. Microhoning of holes is along same axis from which O.D. was turned.



For electrical and mechanical efficiency, assembled motors must have a uniform air-gap between rotor and stator of .006 inch to .011 inch. Because laminated surface is rough and close tolerances must be held, special guided Micromold tools are used. Plastic guides above and below abrasive sticks, control dressing of abrasive and assure generation of round, straight shaft holes.

Before installing Microhoning equipment, two operations were required to finish shaft hole—rejects ran high. Microhoning greatly reduced the amount of dynamic balancing correction required.

The principles and applications of Microhoning are explained in a 30-minute, 16 mm, sound movie, "Progress in Precision" . . . available at your request.

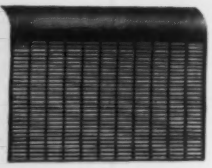
☐ Please send me "Progress in Precision" in time for showing on _____ _____(date).
☐ Please have a Micromatic Field Engineer call.
☐ Please send Microhoning literature and case histories.

NAME _____
TITLE _____
COMPANY _____
STREET _____
CITY _____ ZONE ____ STATE _____ D

MICROMATIC HONE CORP.
8100 SCHOOLCRAFT AVENUE · DETROIT 38, MICHIGAN

Perforated Metal Products and Parts

Pickling Basket



Air Inlet Screen for Oil Burner

We, of course, supply manufacturers with perforated metal sheets and plates in a wide variety of sizes and shapes, from which they produce their own products and parts, but we are also fully equipped to relieve them of a great deal of this work. We weld, spot-weld, or rivet, stiffeners and angles to the pieces and can form or flange them to special shapes as required. The items here shown are typical of hundreds we have furnished to other manufacturers during nearly a half century of successful experience.

Perforated Metal, spot-welded to specially formed angles.

YOU'LL SAVE MONEY in most cases, by placing orders with us for perforated metal parts, to be delivered in lots throughout the year in accordance with your production schedules. Specialized equipment and procedures will usually enable us to do the work at lower cost than it could be done in your own shops. Send us your blue prints and specifications. When given sufficient information, our engineers are often able to make money-saving suggestions and always welcome an opportunity to do so.

DIAMOND MANUFACTURING CO., WYOMING (Wilkes-Barre Area) **PENNA.**

New Bulletin No. 51, Describes DIAMONTEX Perforated Metal Lay-in Panels for Modern Acoustical Ceilings.

One Sure Way to CUT COSTS!

use a

C-F SHEET LIFTER

The A. B. Dick Company, Niles, Illinois, found that this C-F Lifter has substantially reduced man hours and crane time required to move stock in and out of storage.

Up to 10,000 lbs. of high grade sheets in varying widths may be picked up, carried and unloaded at shears or machines with speed and economy by the Lifter and its operator.

C-F Lifters are made in standard or semi-special models to handle from 2 to 60 tons. Bulletin SL-30 describes the advantages you can obtain from C-F Lifters. Write for it today.

CULLEN-FRIESTEDT CO.

1308 South Kilbourn Avenue • Chicago 23, Illinois

NEW Literature

Write directly to the company for a copy

Snap-In Switches, Indicators

"Series 2 Lighted Indicator and Push-button Switch Devices," explains how almost any switching requirement is met by a wide selection of switch units which simply snap into rectangular mounting holes. Advertising Dept., Micro Switch Div., Minneapolis-Honeywell Regulator Co., Freeport, Ill.

Tool Manual on Carbides

A 64-page booklet will help machine operators, tool layout men, and tool maintenance men in the selection, application, and maintenance of cemented carbide cutting tools. Kennametal Inc., Latrobe, Pa.

Silicon Rubber Compounds

Product and application data for three new room temperature vulcanizing compounds are described in a bulletin, CDS-170. Silicon Products Dept., General Electric Co., Waterford, N. Y.

Abrasives for Peening, Cleaning

A catalog covers SAE specifications on all types of abrasive shot, grit, and cut wire. It describes methods of shot peening and impact cleaning, and gives proper abrasive mixtures. Cleveland Metal Abrasive Co., 888 E. 67th St., Cleveland 3, Ohio.

Automatic Logging System

The application and operation of GE's new Automatically Programmed Remote Indication Logging System is described in an 8-page bulletin, GEA-2925. General Electric Co., Schenectady 5, N. Y.

Aluminum Casting Alloys

The composition, properties, and physical and mechanical characteristics of primary aluminum casting alloys are detailed in an 8-page brochure. Federated Metals Div., American Smelting & Refining Co., 120 Broadway, New York 5, N. Y.

Integrally Finned Tubing

A 13 per cent increase in surface area of Trufin admiralty tubing (it's integrally finned) will lower the amount of material required in shell and tube heat exchangers. A reference catalog lists sizes, alloys, heat transfer data, and application data. Wolverine Tube Div., Calumet & Hecla Inc., 17200 Southfield Rd., Allen Park, Mich.

Automatic Keysort System

A 10-page brochure, S-500, explains a new data processing system in nontechnical terms and illustrates how an original unit record can be coded for automatic processing with flexible, low cost machines. Data Processing Div., Royal McBee Corp., Port Chester, N. Y.

This lightweight "No Charge" spool is typical of Roebling's modern packaging methods that save customers time and money.

Are You Getting What You Pay For?

When you pay for HIGH QUALITY high-carbon wire, you want to be sure you get it. You do, when it is supplied by Roebling.

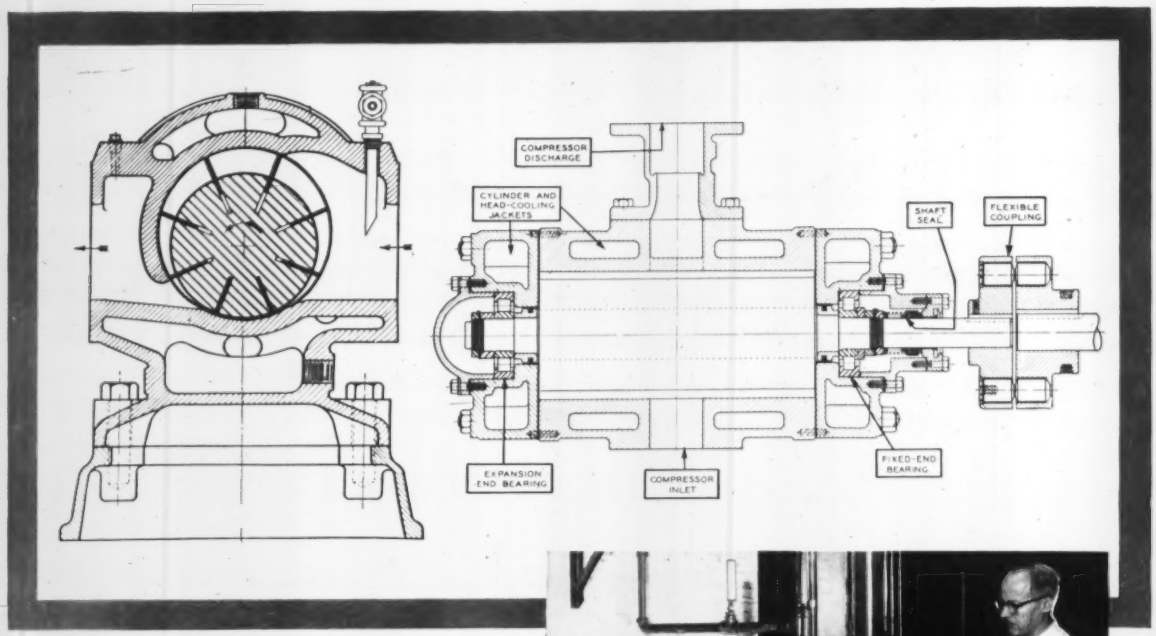
It is unsurpassed in quality, consistently true to specifications, and absolutely uniform in gauge. Hundreds of manufacturers attest to this fact . . . the qualities that they *pay* for—they *get* in Roebling high-carbon wire. The length of our relationship with customers proves it.

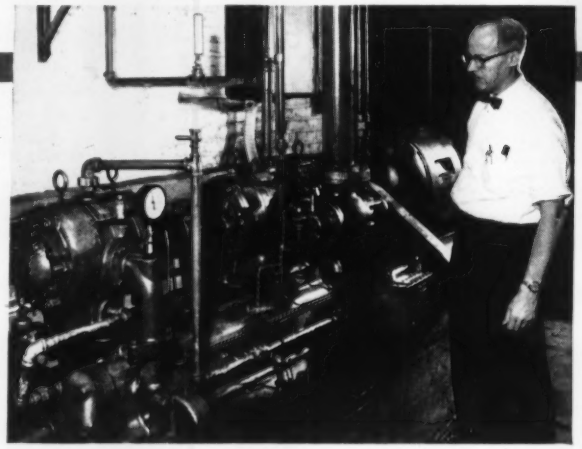
We'll be glad to show you what we mean. For information on superior high-carbon wire or cold rolled strip, write Wire and Cold Rolled Steel Products Division, John A. Roebling's Sons Corporation, Trenton 2, New Jersey.

ROEBLING

Branch Offices in Principal Cities—Subsidiary of The Colorado Fuel and Iron Corporation

Roebling... Your Product is Better for it





Hard service never affected this Fuller rotary's original output—230 cfm. of air at 90 lb. G., reports Mr. Schott, chief engineer, Thomas C. Wilson, Inc., Long Island City, N.Y.

FULLER ROTARY COMPRESSOR RUNS 13 YEARS WITHOUT DOWNTIME

A Fuller rotary at Thomas C. Wilson, Inc. got its first maintenance shutdown recently, for renewal of roller bearings and rotor vanes—after running without downtime since 1945.

4 years of 24-hour service. The Wilson plant makes tube cleaning equipment, tube expanders and portable pneumatic tools, and so makes heavy daily demands on shop air. For the first four years, three-shift operation kept the Fuller rotary running round the clock. Since 1949, it's been working eight-hour shifts.

Simple design means trouble-free service. Besides bearings, the only moving parts in a Fuller vane-type rotary compressor are the cylinderical rotor and the blades. These compensate for wear automatically. Cylinder head slips off, permitting blade and bearing inspection in a matter of minutes.

Compact and vibration-free. Direct-drive system saves space. Simple, rugged design gives constant service without extensive supervision. Thus, Fuller rotaries can be installed out-of-the-way—on upper floor, on balconies, in basement corners, using low-cost, light-weight foundations.

1189
C-340

Write today for detailed information on the full line of Fuller rotary compressors for in-plant services, gas gathering, and industrial refrigeration.

FULLER COMPANY
GENERAL AMERICAN
TRADE MARK

FULLER COMPANY
160 Bridge St., Catasauqua, Pa.
SUBSIDIARY OF GENERAL AMERICAN TRANSPORTATION CORPORATION
Birmingham • Chicago • Kansas City • Los Angeles • New York • San Francisco • Seattle

Fuller
....pioneers in harnessing AIR

PIONEERS OF HIGH-EFFICIENCY VANE TYPE ROTARY COMPRESSORS SINCE 1930

April 13, 1959

Six Week Strike Won't Slow Steel Use

STRIKE OR NOT, metalworking will use 6 million to 6.5 million tons of finished steel a month during the third quarter. That's about the current rate of consumption, and it's unlikely that we'll see a change of pace. Reason: Big users like the automotive, appliance, furniture, and farm equipment industries are at peak production now. Their demands won't increase. Steel requirements for construction, pipeline, and the oil country will probably rise during the summer, but vacation shutdowns in other industries will offset the gains.

If we have a strike that lasts more than six weeks, consumers will start using steel at a slow rate. Total stocks will be cut nearly in half and they will out of balance.

IF THERE'S NO STRIKE— Look for consumers to cut their inventories by about 3 million tons during the third quarter if strike fears prove unfounded. Some users will say they're "not going to buy another pound," but nearly as many will stay in the market or even increase their orders. It's a mistake to assume that all buying will suddenly cease. Steelmaking operations may drop to 55 per cent of capacity in July or August, but they'll probably average 63 or 64 per cent for the quarter.

AUTO SALES IMPROVE— Car dealers shifted into high toward the end of March and made the month their best since December, 1957. Sales averaged about 18,900 a day, 12 per cent more than in February and 35 per cent more than in March, 1958. Although new cars are selling at a seasonally adjusted rate of 6 million, industry leaders haven't raised their sights. They're still thinking in terms of a 5.5 million car year. Ford Motor Co. is upping its April production of Fords by 20 per cent and may have to order additional steel for June delivery. Reason: Material that was bought originally for strike protection has probably been pressed into immediate service.

CONSTRUCTION SETS RECORD— Second only to the automotive industry as a steel user, construction will probably be a better customer this year than it was in 1958. During the first quarter, the value of new construction put in place was a record $10.9 billion. Most of the rise was in new home building, which benefits steelmakers indirectly. New houses mean more appliances, pipelines, shopping centers, and commercial and municipal buildings. Heavy construction awards through March were 20 per cent above those of the corresponding period in 1958.

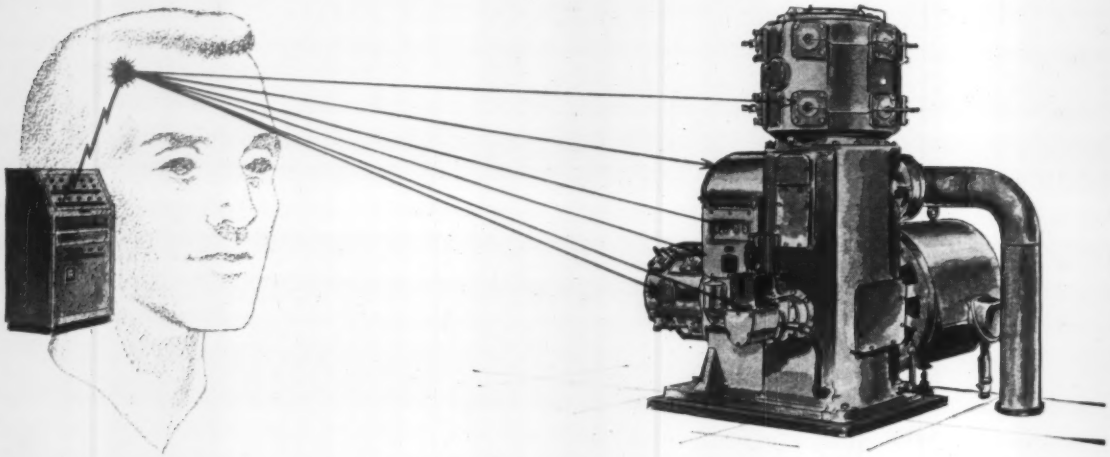
DEMAND SLACKENS— Consumers are still pressing for delivery of everything they've ordered before June 30, but they're not looking for extra tonnage. Most of them feel that they're pretty well set for a strike. Steelmakers are sold out for the second quarter on carbon, silicon, and galvanized sheets. They're fully booked on line pipe and oil country goods but can still offer prompt delivery of standard pipe. Hot-rolled bars and plates are tightening fast. Structurals are readily available.

PRODUCTION HOLDS— Last week, steelmakers ran their furnaces at 93.5 per cent of capacity and turned out 2,647,000 net tons of steel for ingots and castings. Despite the high level of industry operations, STEEL's composite scrap price fell 83 cents to $36.17 a ton—the lowest it has been since July, 1958.

WHERE TO FIND MARKETS & PRICES

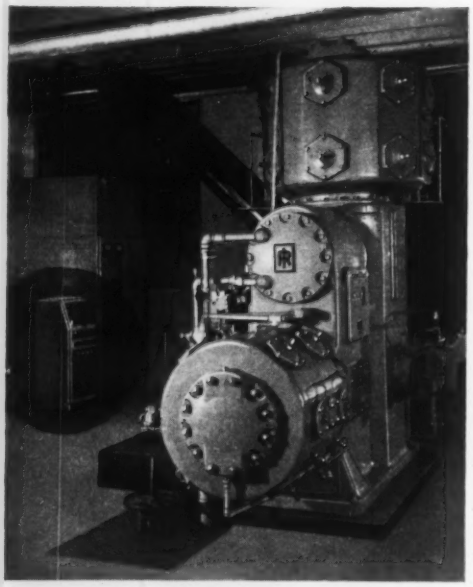
	News	Prices
Bars, Merchant	142	150
Reinforcing	141	151
Boiler Tubes	...	*
Clad Steel	...	154
Coke	...	156
Coal Chemicals	...	156
Charts:		
Finished Steel	...	149
Ingot Rate	148	...
Scrap Prices	...	161
Comparisons	...	149
Contracts Placed	167	...
Contracts Pend.	168	...
Electrodes	...	156
Fasteners	...	153
Ferroalloys	...	158
Fluorspar	...	156
Footnotes	...	153
Imported Steel	...	156
Ingot Rates	148	...
Metal Powder	...	156
Nonferrous Met.	164	166
Ores	147	156
Pig Iron	147	155
Piling	...	150
Plates	144	150
Plating Material	...	167
Prestressed Strand	...	153
Price Indexes	...	149
Producers' Key	151	...
R.R. Materials	...	153
Refractories	...	156
Scrap	160	162
Semifinished	...	150
Service Centers	148	155
Sheets	142	151
Silicon Steel	...	152
Stainless Steel	148	154
Strip	142	152
Structurals	161	150
Tin Mill Prod.	148	152
Tool Steel	148	154
Tubular Goods	144	154
Wire	143	152

*Current prices were published in the Apr. 6 issue and will appear in subsequent issues.



Making a Compressor "Think for Itself"

New 'Tendamatic control brings automatic supervision to the COMPRESSOR PLANT



'Tendamatic control of this Ingersoll-Rand type XLE two-stage heavy-duty air compressor assures maximum protection of capital investment, maximum manpower utilization, continuity of production and lower maintenance expense.

INGERSOLL-RAND's new *'Tendamatic* control is like a *tireless attendant,* who keeps checking the operation of your compressor every second.

All you need to do is push the start button; the 'Tendamatic does everything from then on. Its built-in safeguards eliminate routine inspection and supervision, detect trouble before it can do any harm to the compressor, and put all maintenance on a low-cost *preventive* basis.

This completely automatic control system keeps an eye on air pressure and temperatures... lubricating oil pressure and temperature... the cylinder lubricator... and the float level in the condensate trap. It watches for leaking valves and mechanical failure of running parts.

Any time there is a variation from normal operation, the 'Tendamatic identifies the nature of the malfunction and gives audible *and* visible warnings. If the warnings are ignored or forgotten, 'Tendamatic shuts down the compressor before any damage can result.

Ingersoll-Rand

I-873 11 Broadway, New York 4, N. Y.

GAS & DIESEL ENGINES • PUMPS • AIR & ELECTRIC TOOLS • CONDENSERS • VACUUM EQUIPMENT • ROCK DRILLS

In Decade, U. S. Re-bar Shipments Up

29%

	NET TONS
1958	2,034,795
1949	1,572,588

But Imports Skyrocket

4500%

	NET TONS
1958	472,741
1949	10,269

SPARKED by seasonal expansion in construction, reinforcing bars (domestic and imported) are moving at the best pace in months.

Rolling mill schedules are more extended than they were; fabricators' backlogs are growing. Supplies are tightening, though mills and fabricators are still promising relatively prompt shipments.

• Contracts for heavy construction are up sharply from a year ago.

That is where deformed building bars find broadest application. They bulk particularly large in dams and similarly large engineering projects, such as the St. Lawrence Seaway. Depending on the type of dam, engineers allow for 60 to 160 lb of reinforcing steel per cubic yard of concrete poured.

Other types of construction—institutional structures, some classes of commercial and office buildings, and highwaywork—also take substantial tonnages of re-bars.

In the first 13 weeks of this year, heavy construction awards totaled $4.6 billion, 20 per cent above a year ago. Awards are the heaviest since boom 1956, currently running at an estimated $355.4 million weekly.

• Strike hedge buying is contributing to market buoyancy.

But stockpiling is conservative, even though buyers are conscious of a likely increase in mill prices.

And price is more important than ever in re-bars, largely because of imports offered at prices 5 to 35 per cent under domestic steel quotations.

• The crest of the foreign flood is not yet in sight.

Last year, re-bar imports totaled 472,741 net tons, equal to about 23 per cent of domestic mill shipments of 2,034,795 tons. Coming mostly from western Europe, and more recently Japan, the tonnage over the last decade has risen 4500 per cent, contrasting with a 29 per cent rise for domestic mill shipments (see above).

The import shock has been most severe in coastal markets. But with the opening of the St. Lawrence Seaway, the foreign flood is expected to spill into the Midwest.

• Re-bar use has expanded steadily through the years.

Back in 1868, a French gardener named Joseph Monier hit upon the idea of strengthening concrete by incorporating a network of small iron rods in building water basins. Today, re-bars are produced in this country by 37 makers in accordance with American Society for Testing Materials' standard specifications. Producing capacity is in 21 states.

• ASTM enlarges the size range of bars to meet needs.

Until two years ago, re-bars produced under ASTM specifications were available in nine sizes, designated from No. 3 to No. 11. The No. 11, the largest produced under an ASTM designation, is 1.410 in. in diameter, and weighs 5.313 lb per ft.

In 1957, specifications for two special large size deformed billet-steel reinforcing bars were promulgated. These were designated No. 14S and No. 18S. The new specs were revised in 1958, and accepted Sept. 9 last year.

• Use makes for freer flow of concrete in some situations.

Acceptance of the king size re-bars has been increasing. The No. 14S weighs 7.65 lb per ft, and has a diameter of 1.693 in. The No. 18S weighs 13.60 lb per ft and has a diameter of 2.257 in. The approximate number of eighths of an inch in nominal diameter is used for the code numeral.

They're used principally where a large percentage of steel is required in limited space; bar crowding, which inhibits the free flow of concrete, is eliminated. That may be in heavy columns, the haunches of rigid frame bridges, beams or girders, as well as in massive structures like dams, heavy foundations, and footings. Dam designers formerly specified several rows of closely spaced No. 11 bars, a practice which made concreting operations difficult.

• Large sizes are produced by several mills.

Production of the large sizes is not strictly a development of the last couple of years. Inland Steel Co. has been producing bars similar to ASTM 14S and 18S since 1953.

Today, at least a dozen mills offer large sizes, and a number of others are considering entering the field. Large mill equipment for rolling, cutting, and handling is re-

quired. Heavier bending machinery is necessary in shops and in the field. Crane handling equipment may be needed at job sites. Most mills have the equipment.

Small mills with electric furnaces not now rolling the No. 14S bar could do so. But the rolling of No. 18S is a much different proposition, requiring large heating furnaces, ingot molds, and bending equipment that many don't have.

• **Fabricators may need heavier bending equipment.**

Relatively few fabricating shops have bending equipment large enough to handle the No. 14S or 18S. In some cases, they may farm out such jobs, but equipment manufacturers expect a good volume of new business as the large sizes gain in popularity.

Exact production data are not available, but one major producing company estimates annual output of large size bars is running around 20,000 tons annually. Steady growth is anticipated as design engineers and specifying authorities become more familiar with the king sizes.

Steel Bars . . .

Bar Prices, Page 150

Some hot-rolled carbon bar tonnage for June shipment is still available. By shopping around, consumers can pick up a little tonnage for May delivery. One producer said last week: "We can still squeeze some orders into June schedules but only in limited quantities and for regular customers."

Over-all, the supply situation is getting increasingly tight, at least for the rest of this quarter. Consumers are showing little interest in third quarter needs. This is understandable in view of the uncertain labor outlook and the fact that most buyers have been able to cover their current needs and do some stockpiling.

Buying of bars has been reasonably brisk, but there hasn't been the pressure for this product that has marked other classifications, especially the light flat items.

Sheets, Strip . . .

Sheet & Strip Prices, Pages 151 & 152

Specifications for cold rolled sheets are in mill schedules for virtually the entire second quarter. June set-asides have been largely replaced by definite orders. In slightly less degree, that holds for hot rolled sheets, while galvanized sheet specifications have long since been in producers' hands, filling capacity.

Some second quarter space is still open in enameling stock, electrical sheets, and other specialties schedules. But demand for these classifications is strong and sellers are confident they'll get orders for all the tonnage they can handle in the next couple of months. Some stainless sheet and strip orders for June are still being booked in New England.

Third Quarter Inquiry Light— Most consumers estimate they'll have enough tonnage at the end of June to carry them well into the next month or so, especially in light of manufacturing curtailments for vacations.

Generally, it's thought resumption of heavy buying will probably be deferred by most consumers until September. That means production

Everyone Responsible for Material Movement

should have this folder featuring ROGERS INDUSTRIAL LOCOMOTIVES

It illustrates and describes advanced features that assure greater hauling efficiency, easier control and a longer life of useful service.

5 to 40 tons capacity. Track gages 21 to 56½ inches. Diesel or gasoline engines. Hydraulic or electric transmissions. Improved exhaust scrubber. Unit welded frames and cabs. Locomotives designed to meet special requirements.

Write today for literature.

ROGERS BROTHERS CORPORATION

ALBION, PENNA.

Export Office: 50 CHURCH ST., NEW YORK 7, N. Y., U. S. A. Cable Address: Rogloco

will likely drop over the summer, strike or no strike. But, if auto sales continue to improve, the slump in steelmaking may not be as precipitous as some observers now expect.

Record Breaking Month—March shipments of a Pittsburgh district mill were the largest in its history. "We'll do as well this month," said a sales executive last week, "but we can't do any better. We're right up to our capacity."

Despite tremendous demand, producers are maintaining schedules. Since trucks are scarce, traffic men are switching big tonnages from the motor carriers to the railroads.

In connection with present inventory expansion, more tonnage—principally for auto account—is going into off-premise storage as consumers run out of space in their own plants. Such storage is sure to accelerate as June 30 approaches and in-plant space becomes exhausted.

Supplies Thought Adequate—Some observers say there are few manufacturing plants that won't have enough steel to operate 60 days if there is a steel strike. Some users may be accumulating too much inventory.

Steel Shipments Increase

Mill shipments of steel products in February totaled 6,524,374 net tons, reports the American Iron & Steel Institute. That's an increase of 5.5 per cent over the January total, and 2,261,000 tons greater than the February, 1958, total.

Principal products shipped during the month were: Cold rolled sheets (1,329,580 net tons); hot rolled sheets (783,689); hot rolled bars, including light structural shapes (656,315); plates (558,079); electrolytic tin plate (442,625).

Shipments of 32 products, out of 39 reported on by the institute, showed increases over the January levels.

Major markets during February included: Automotive (1,494,440 net tons); warehouses and distributors (1,161,842); construction, including maintenance (769,827); containers (571,143); and machinery, industrial equipment and tools (408,955). Each of those market classifications received larger tonnages during the month than in January.

Wire . . .

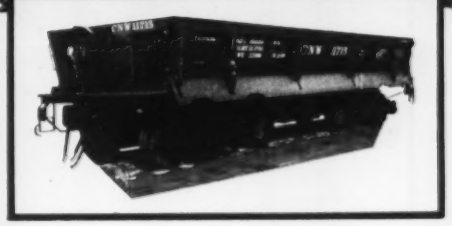
Wire Prices, Pages 152 & 153

Seasonal pickup in merchant product trade, along with continued improvement in requirements for manufacturers' grades, is reflected in stepped up schedules at the wire mills. There has been some strike hedge buying, but makers can still handle additional May and June orders.

In New England, it's reported that wire rod consumers have covered their needs through June. But there are openings in finished carbon wire schedules that month. April-May volume is 10 to 15 per cent higher than that in March. Most hedge buying called for April-May shipments, so that district producers are in favorable position to take June business.

Industrial consumption of wire is moderately improved. Use in fasteners, springs, and specialties is increasing, the pickup in these consuming areas stimulating supple-

MAGOR AIR DUMP CARS



New Magor Air Dump Cars are designed to take the toughest punishment—and keep going! Rugged end construction of double plate across load carrying members and tapered end design shrug off abuse. Alloy steel in structural members, wearing parts gives added strength where it's needed most! Except for the rubber coupling hose at the ends of the car, the entire air supply system is made of extra heavyweight black steel pipe, immune to damage by heat of lading!

These are really rough and ready cars, designed specifically for the job—built to last! Every feature (and we've mentioned only a few) is made to take the tremendous beating that goes with Steel Plant operation.

MAGOR

For the full story, write today for the new folder, "The Answer to High Refuse Disposal Costs."

MAGOR CAR CORPORATION

50 Church Street
New York 7, N.Y.

look at these advantages of

IRIDITE FINISHES

for

CORROSION-RESISTANCE,

PAINT BASE on

ALUMINUM and MAGNESIUM

EASE OF USE—Iridite is a simple chromate conversion treatment that is economical. You use dip, brush or spray it on the part at room temperature. No special equipment. No specially trained personnel.

OUTSTANDING PERFORMANCE—Forms a film that is an integral part of the metal itself. Can't flake, chip or peel. Unless paint is used on baked applications, and the bond fails. Even passes salt spray unscathed in use.

LOWEST COST—You have only minimum equipment cost to spread under high speed operations. Lower overall handling costs.

CHOICE OF APPEARANCE—Clear coatings that retain metallic luster in dull, uniform iridescent coatings. A variety of colors is available by dyeing.

Iridite 14-2 and 14-2 A for Aluminum

Our specially developed finishes that give you maximum results in aluminum treatment. Both provide excellent adhesion between metal and paint base. Iridite 14-2 A is an improved product that allows greater flexibility in operations and coating thickness and provides the optimum in corrosion resistance.

Iridite 12 for Magnesium

Produces a protective, satin base film with corrosion resistance far above that of the chromate base finish. High corrosion resistance. Unattacked by 5% salt spray for 168 hours. Meets Specification AMS-M-3171, Type III.

Write for Bulletin

Allied Research Products, Inc.

mental hedge buying, notably of high carbon grades.

While demand for merchant wire products is more active, stiff competition is being met in this area of the market. Foreign prices, however, were reported firming at Houston last week. Two district depots announced across-the-board increases of $3 a ton as of Apr. 1.

Tubular Goods . . .

Tubular Goods Prices, Page 134

Oil country specialties are in heavy demand as drillers prepare for a more active season and protect themselves against possible strike-induced shortages this summer. Sales of standard items are on the upgrade, while sales of alloy items are showing surprising strength.

A major producer describes its backlog as "comfortable," but says he could accept a little more tonnage on first half shipment. Because of the strike threat, however, some steelmakers are booking 35 to 40 per cent above normal. They'll be content if normally it doesn't go over a 20 per cent strike, but the chances are they won't be content to preserve even

Demand for standard pipe is increasing in preparation for the season. The Youngstown mill shipments will jump about 20 per cent this month; additional gains are forecast for May.

Pipes . . .

Pipe Prices, Page 136

Despite evidence that current resource stockpiling, maintenance of oil string "turn-up" and new customers who want additional tonnage can be mills to some degree to accommodate such purchases, though their selling practices in recent weeks have shown a tendency to

This late model emission-type spectrograph can give direct dial readings on as many as 20 different chemical elements in testing the composition of a special steel alloy.

Latest laboratory equipment speeds quality control at Standard

Installed in the Metallurgical Laboratory at Standard Steel Works are the latest scientific testing instruments for the most accurate and rapid testing of steels in all stages of production. Samples are delivered by pneumatic tube from melting furnace to laboratory in 90 seconds. Using the spectrograph pictured above, analyses can be determined in 1½ minutes, saving hours of time over older methods.

Standard's recently installed electric furnace and vacuum degassing equipment assure delivery on special alloy products in the shortest possible time. Standard's quality control procedure guarantees that your most exacting requirements will be met. Write Dept. 2-D for details.

There is a specific refraction index to fluorescent X-rays for each metal, and this latest, most interesting use of them is employed to determine the composition of certain stainless and other high-alloy steels.

Standard Steel Works Division

BALDWIN · LIMA · HAMILTON

BURNHAM, PENNSYLVANIA

Rings • Shafts • Car wheels • Gear blanks • Flanges • Special shapes

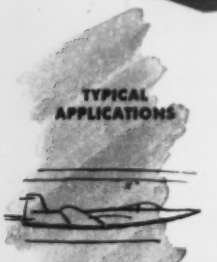
look at these advantages of

IRIDITE FINISHES

for

CORROSION-RESISTANCE,
PAINT BASE on
ALUMINUM and MAGNESIUM

TYPICAL APPLICATIONS



Aircraft and Missile Parts

Automobile Hardware

Outdoor Furniture

Communications Equipment

Marine Equipment

EASE OF USE—Iridite is a simple chromate conversion treatment. Fast, easy, economical. You just dip, brush or spray it on the part at room temperature. No special equipment. No specially trained personnel.

OUTSTANDING PERFORMANCE—Forms a film that is an integral part of the metal itself. Can't flake, chip or peel. Takes paint firmly on initial application, and the bond lasts. Even protects areas scratched in use.

LOWEST COST—You have only minimum equipment cost, no special racks, high speed operation, lower overall handling costs.

CHOICE OF APPEARANCE—Clear coatings that retain metallic lustre to dark, maximum protection coatings. A variety of colors is available by dyeing.

IRIDITE #14 and #14-2 (Al-Coat) for ALUMINUM

Two specially formulated finishes that give you maximum latitude in aluminum treatment. Both provide excellent corrosion protection and paint base. Iridite #14-2 is an improved product that allows greater flexibility in operation and coating thickness and produces the optimum in corrosion protection.
Either coating provides corrosion resistance superior even to complicated electrolytic treatments in a fraction of the time. These coatings also offer many other valuable characteristics: they have low electrical resistance, they aid in arc-welding, provide a good base for bonding compounds, have no effect on the dimensional stability of close-tolerance parts. Final appearances ranging from clear through yellow iridescence to full brown can be obtained. By dyeing, you can produce red, green, blue, orange or yellow finishes.

IRIDITE #15 for MAGNESIUM

Produces a protective, paint base film with corrosion resistance at least equal to that obtained from long, high-temperature dichromate treatments in a fraction of the time and at room temperature. The appearance of the coating can be varied from light brown to dark brown and black.

APPROVED UNDER GOVERNMENT AND INDUSTRIAL SPECIFICATIONS

SEE FOR YOURSELF WHAT IRIDITE CAN DO . . . SEND SAMPLE PARTS FOR FREE PROCESSING. Look at the results, test the protection, evaluate the savings. Also write for handy Reference File of the most complete data published on chromate conversion coatings. Or, for immediate information, call your Allied Field Engineer. He's listed under "Plating Supplies" in your classified phone book.

Allied Research Products, Inc.

4004-06 EAST MONUMENT STREET
BALTIMORE 5, MARYLAND

***Manufacturers* of IRIDITE®, IRILAC™, ARP® Brighteners and Plating Chemicals — West Coast Licensee: L. H. Butcher Co.**

mental hedge buying, notably of high carbon grades.

While demand for merchant wire products is more active, stiff competition is being met in this area of the market. Foreign prices, however, were reported firming at Houston last week. Two district depots announced across-the-board increases of $3 a ton as of Apr. 1.

Tubular Goods . . .

Tubular Goods Prices, Page 154

Oil country specialties are in heavy demand as drillers prepare for a more active season and protect themselves against possible strike-induced shortages this summer Sales of standard items are on the upgrade, while sales of alloy items are showing surprising strength.

A major producer describes his backlog as "comfortable," but says he could accept a little more tonnage for first half shipment. Because of the strike threat, downriver stocks of some pipemakers are probably 35 to 40 per cent above normal. They'll be cleaned out rapidly in event of a midyear strike, but the chances are they won't be rebuilt to prestrike levels.

Demand for standard pipe is improving as construction picks up seasonally. One Pittsburgh mill's shipments will jump about 20 per cent this month; additional gains are forecast for May.

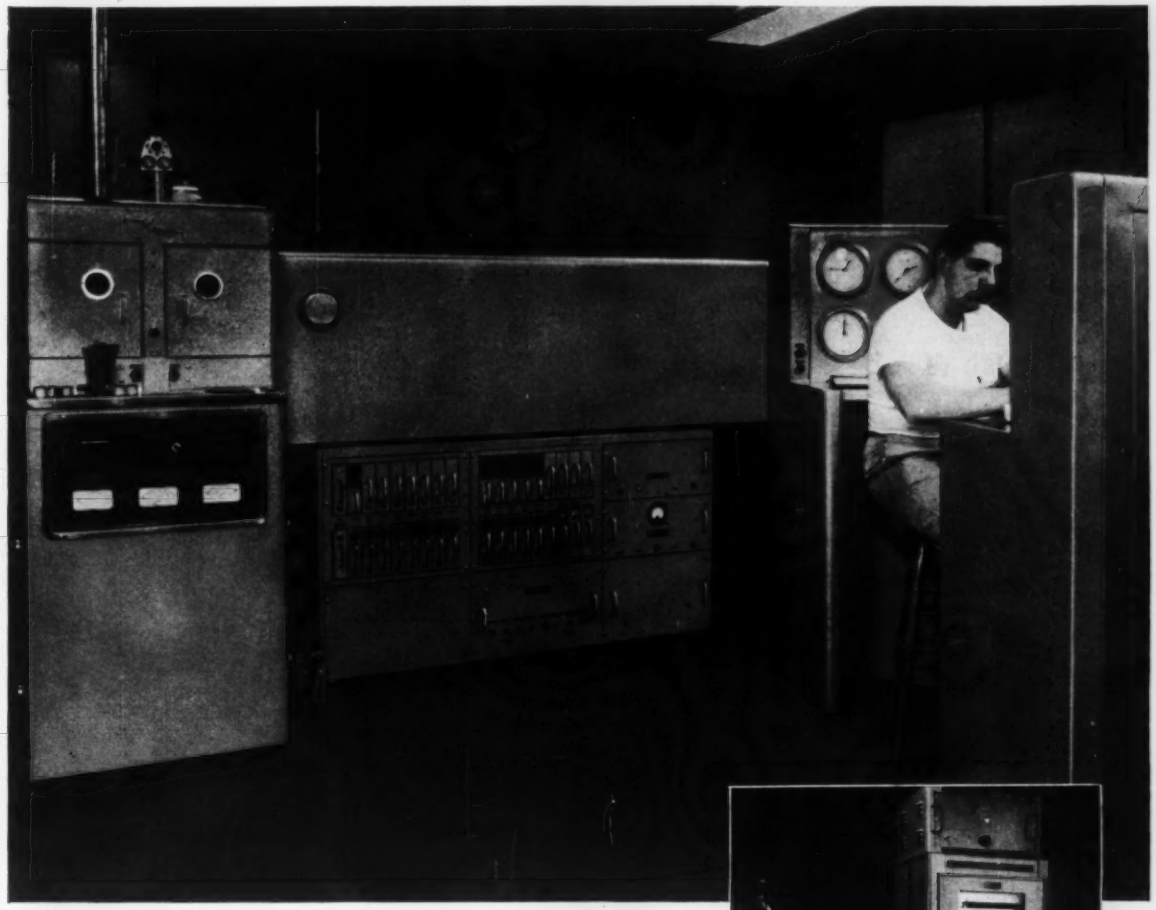
Plates . . .

Plate Prices, Page 150

Despite evidence that demand pressure is diminishing, platemakers are still getting "hurry-up" calls from customers who want additional tonnage. And the mills are doing their best to accommodate such requests, though their rolling schedules are pretty well choked up for April and May.

Two reasons are advanced for demand leveling off: 1. Heavy recent buying for current needs and reasonable buildup of inventories before the end of June. 2. Soldup position of producers, especially in sheared plate.

Demand for 96 in. plates is far in excess of one midwestern mill's ability to produce. Although this maker is accepting orders for June delivery, he will probably have to disappoint



This late model emission-type spectrograph can give direct dial readings on as many as 20 different chemical elements in testing the composition of a special steel alloy.

Latest laboratory equipment speeds quality control at Standard

Installed in the Metallurgical Laboratory at Standard Steel Works are the latest scientific testing instruments for the most accurate and rapid testing of steels in all stages of production. Samples are delivered by pneumatic tube from melting furnace to laboratory in 90 seconds. Using the spectrograph pictured above, analyses can be determined in 1½ minutes, saving hours of time over older methods.

Standard's recently installed electric furnace and vacuum degassing equipment assure delivery on special alloy products in the shortest possible time. Standard's quality control procedure guarantees that your most exacting requirements will be met. Write Dept. 2-D for details.

There is a specific refraction index to fluorescent X-rays for each metal, and this latest, most interesting use of them is employed to determine the composition of certain stainless and other high-alloy steels.

Standard Steel Works Division

BALDWIN · LIMA · HAMILTON

BURNHAM, PENNSYLVANIA

Rings • Shafts • Car wheels • Gear blanks • Flanges • Special shapes

The CECO-DROP is setting new records -for lower costs -for higher production

← Chambersburg's new 28 page forge shop modernization bulletin. Based on studies made in prominent forge shops, this publication assists you to formulate your own step-by-step modernization program. Write for a copy today.

CHAMBERSBURG ENGINEERING COMPANY · · CHAMBERSBURG, PA.

some customers. Green crews aren't up with their schedules.

In general, plate supply for this quarter is stringent, and consumers are not much disposed to order for delivery beyond; nor are producers encouraging such ordering. Some universal plate is available for June delivery. Also, some strip plate is available for that month despite the tight situation in sheets and strip.

Iron Ore . . .

Iron Ore Prices, Page 156

Stocks of iron ore in the U. S. and Canada at the end of February totaled 54,393,197 gross tons, reports the American Iron Ore Association. At the end of February a year ago, the total was 57,794,413 tons. (See accompanying table for the breakdown.)

Consumption of iron during the month amounted 10,167,309 gross tons vs. 6,862,261 in the like month of 1958. The cumulative total to the end of February was reported at 20,492,298 tons, against 14,892,-136 tons in the first two months of last year. (See table.)

At the end of February, 225 of 276 blast furnaces were in operation (215 in the U. S. and ten in Canada). At the end of February a year ago, active stacks numbered 175 (164 in the U. S. and 11 in Canada).

Pig Iron . . .

Pig Iron Prices, Page 155

Flow of new business to merchant iron producers is the best they have had so far this year. Bookings were larger in March than in either January or February and they likely will increase further this month.

Gains are credited to heavier consumption. Foundries have shown no disposition yet to accumulate large inventories. That may come a little later as the steel strike threat draws closer. To date, furnace delivery promises have been easy and substantial tonnages of foreign iron are available. Consequently, there is no pressure to get under cover before summer.

Producers continue to increase operations.

Republic Steel Corp. is dismantling its sintering plant at Birmingham. The facility will be reconditioned and installed at the com-

Iron Ore Statistics—February, 1959

Stocks on hand at furnaceyards and docks at end of month

(Gross tons)

	U. S. Ores		Canadian Ores		Foreign	
At U. S. Furnace Yards:	L. Superior	Other	L. Superior	Other	Ores	Total
Eastern	4,080,928	226,229	123,921	1,255,670	4,546,032	10,232,780
Pitts.-Youngstown	7,900,853	45,294	521,578	1,865,570	3,588,482	13,921,777
Cleve.-Detroit	7,263,523	91,997	224,319	318,186	295,689	8,193,714
Chicago	8,992,831	(a)	(a)	.....	(a)	8,992,831
Southern	(a)	2,155,312	.....	(a)	2,465,467	4,620,779
Western	.....	982,536	.....	.....	.....	982,536
Total	28,238,135	3,501,368	869,818	3,439,426	10,895,670	46,944,417
At U. S. Docks						
Lake Erie	3,520,790	.....	91,193	1,617,147	.....	5,229,130
Other	.....	.....	.....	(a)	(a)	(a)
Total U. S. Stocks	31,758,925	3,501,368	961,011	5,056,573	10,895,670	52,173,547
Canadian Stocks	1,626,320	.....	111,359	404,746	77,225	2,219,650
Total U. S.-Canada	33,385,245	3,501,368	1,072,370	5,461,319	10,972,895	54,393,197

Consumption in U. S. and Canada During February, 1959

(Gross tons)

	U. S. Ores		Canadian Ores		Foreign	
In U. S. Districts:	L. Superior	Other	L. Superior	Other	Ores	Total
Eastern	645,017	187,496	47,990	226,908	857,536	1,964,947
Pitts.-Youngstown	1,898,412	117,175	67,657	425,509	474,500	2,983,253
Cleve-Detroit	1,144,962	22,825	56,460	21,935	117,358	1,363,540
Chicago	2,084,212	(a)	(a)	.....	(a)	2,084,212
Southern	(a)	459,289	.....	(a)	255,811	715,100
Western	.....	588,197	.....	.....	.....	588,197
In U. S.						
Blast furnaces	4,372,690	964,739	116,785	434,488	659,667	6,548,369
Steel furnaces	154,938	55,560	118	26,104	462,647	699,367
Sintering (1)	1,244,897	354,151	55,204	213,760	582,891	2,450,903
Miscellaneous (2)	78	532	.....	.....	.....	610
Total U. S.	5,772,603	1,374,982	172,107	674,352	1,705,205	9,699,249
In Canada						
Blast furnaces	194,588	.....	65,924	77,789	.....	338,301
Steel furnaces	10,178	.....	.....	13,692	6,330	30,200
Sintering (1)	66,813	.....	8,630	24,116	.....	99,559
Miscellaneous (2)	.....	.....	.....	.....	.....	.....
Total Canada	271,579	.....	74,554	115,597	6,330	468,060
Total U. S.-Canada	6,044,182	1,374,982	246,661	789,949	1,711,535	10,167,309

1. Iron ore consumed in sintering plants not at mine site.
2. Sold to nonreporting companies or used for purposes not listed.
(a) Data included in other districts.
Data from American Iron Ore Association.

TWO WEEKS

or less is the shipping time on most any type and gauge of standard Stainless Steel Strip from .0005 to .125, precision rolled and bright annealed and furnished **exactly as you want it.**

TWO MILLION

pounds of inventory—the largest variety of Stainless Steel Strip in the U.S. From this huge inventory of practically every type Ulbrich can roll any requirement as well as many of the **super alloys.** Four weeks maximum delivery for any order — even for one pound or one foot.

Certified ANALYSIS can be given on any Ulbrich material

SINCE 1924
Ulbrich
"the biggest little mill in the country"

STAINLESS STEELS
WALLINGFORD, CONN.
Phone: COlony 9-7771
TWX Wallingford, Conn. 277

pany's Gadsden, Ala., plant, adjoining the blast furnaces.

Mystic iron prices are unchanged for the second quarter at $68 a gross ton, f.o.b. Everett, Mass., for the No. 2 foundry grade.

Stainless Steel . . .

Stainless Steel Prices, Page 154

Atlas Steels Ltd., Welland, Ont., reduced prices on No. 1 finish stainless steel sheets and plates 15 to 20 per cent, effective Apr. 6. The revisions were made to compete with imported steels from "low wage" countries.

Distributors . . .

Prices, Page 155

Bookings by distributors in most districts are increasing slowly, although activity bears no resemblance to the heavy demand reported by mills.

Business in a few districts, including New York, has slumped in the last week to ten days. Operators of steel service centers at those points see no sign of a pickup this month. They feel that what little improvement developed early in March was due chiefly to seasonal factors. They note little hedge buying, pointing out that consumers are placing most of this type business with mills.

The pricing situation in the Southwest remains unstable. Prices are being undercut by pressure of relatively cheap imported steel. While published prices are unchanged, a great many orders are being placed under the market. An exception is plates, which are in heavy demand at firm prices.

Tool Steel . . .

Tool Steel Prices, Page 154

Shipments of high speed and tool steel (excluding hollow drill steel) in February totaled 7646 net tons, reports the American Iron & Steel Institute. That compares with 7545 tons in the preceding month and 5629 tons in the corresponding month of 1958.

The February total was the highest for any month since the 7915 tons shipped in September, 1957.

Cumulative shipments in the first two months this year were 15,191 tons, compared with 12,178 in the like 1958 period.

Steel Shipments Hampered

Shortages of special railroad cars and trucks are reported threatening to cripple steel production in the Youngstown district. Shipments are being delayed on occasion. There's a particular shortage of covered gondolas (for hauling coils) and special boxcars and hoppers.

"So far we haven't lost any production due to truck shortages, but we've been so close to it that it hasn't been funny," said one traffic man last week.

It's estimated that 60 to 80 per cent of steel shipments of some products, principally coils and sheets, go by truck from the Youngstown district mills. The bulk of pipe shipments, however, is by rail, particularly the large sizes.

Explanation of the situation as made by a mill traffic representative: "We operate seven days a week, 24 hours a day, then try to funnel all that production into an operation of five days, 40 hours a week. It is overcrowding the trucks."

Tin Plate . . .

Tin Plate Prices, Page 152

Price reductions on tin cans, ranging from $1.40 to $2.58 a thousand (depending on size and style), were announced last week by American Can Co., New York. The new prices apply to cans for packing fruits and vegetables. It was estimated that reductions made by the company in January will save customers more than $9 million this year; the latest move means additional millions in savings.

Made in the face of rising costs, the reductions are attributed to technological and other improvements in canmaking.

Shipments of Steel Pails And Drums Off in January

Shipments of steel shipping barrels and drums in January totaled 2,604,595 units, down 2 per cent from the 2,650,371 moved in the preceding month, and up 1 per cent from the 2,587,061 shipped in January, 1958. Steel pail shipments were 5,008,268 units in the month. 2 per cent below the 5,098,831 moved in December, and 7 per cent under the 5,398,273 reported for January last year.

DISTRICT INGOT RATES

(Percentage of Capacity Engaged)

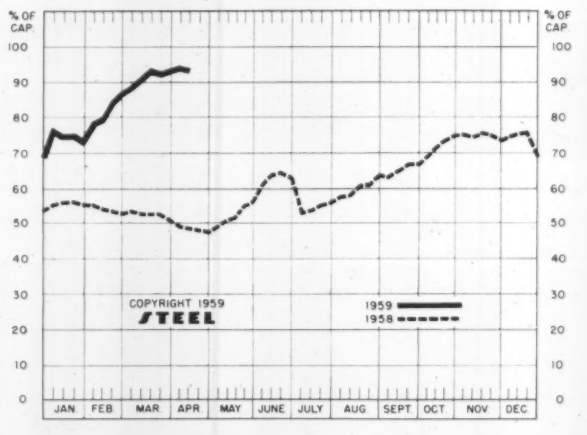
	Week Ended Apr. 12	Change	Same Week 1958	Same Week 1957
Pittsburgh	97	+ 2*	48.5	95.5
Chicago	95	— 0.5*	54.5	90
Eastern	92	0	49	95
Youngstown	93	0	46	89
Wheeling	94	— 1	68	93.5
Cleveland	96.5	— 1.5*	31	86.5
Buffalo	105	0	39	97.5
Birmingham	91.5	+ 2	55.5	95.5
Cincinnati	88	— 1.5*	40.5	61
St. Louis	94	+ 2.5*	65.5	101
Detroit	99	+ 1.5*	13.5	95.5
Western	93	— 5	55	102
National Rate	93.5	— 0.5	48	90.5

INGOT PRODUCTION‡

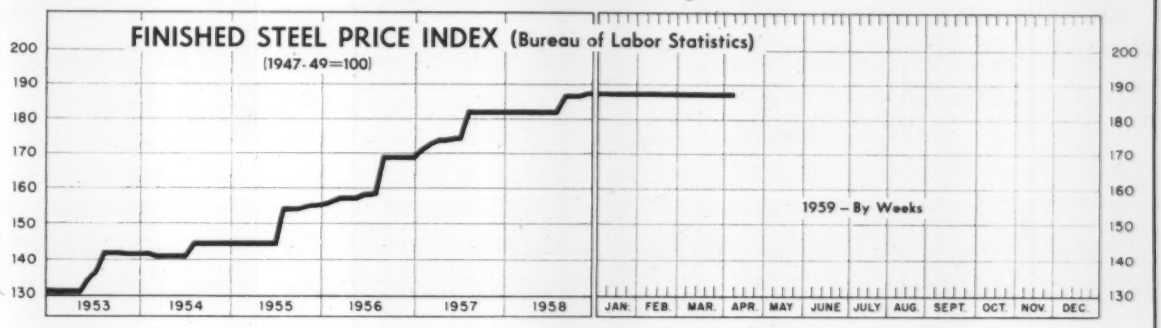
	Week Ended Apr. 12	Week Ago	Month Ago	Year Ago
INDEX (1947-49=100)	164.2†	164.2	162.1	81.4
NET TONS (In thousands)	2,638†	2,638	2,604	1,308

*Change from preceding week's revised rate. †Estimated. ‡American Iron & Steel Institute. Weekly capacity (net tons): 2,831,331 in 1959; 2,699,173 in 1958; 2,559,490 in 1957.

NATIONAL STEELWORKS OPERATIONS



Price Indexes and Composites



Apr. 7, 1959	Week Ago	Month Ago	March Avg	Year Ago
186.7	186.7	186.7	186.7	181.6

AVERAGE PRICES OF STEEL (Bureau of Labor Statistics)

Week Ended Apr. 7

Prices include mill base prices and typical extras and deductions. Units are 100 lb except where otherwise noted in parentheses. For complete description of the following products and extras and deductions applicable to them, write to STEEL.

Rails, Standard No. 1	$5.825	Bars, Reinforcing (lb)	6.385
Rails, Light, 40 lb	7.292	Bars, C.F., Carbon (lb)	10.710
Tie Plates	6.875	Bars, C.F., Alloy (lb)	14.125
Axles, Railway	10.175	Bars, C.F., Stainless, 302 (lb)	0.570
Wheels, Freight Car, 33 in. (per wheel)	62.000	Sheets, H.R., Carbon (lb)	6.350
Plates, Carbon (lb)	6.350	Sheets, C.R., Carbon (lb)	7.300
Structural Shapes (lb)	6.167	Sheets, Galvanized (lb)	8.615
Bars, Tool Steel, Carbon (lb)	0.560	Sheets, C.R., Stainless, 302 (lb)	0.673
Bars, Tool Steel, Alloy, Oil Hardening Die (lb)	0.680	Sheets, Electrical (lb)	12.625
Bars, Tool Steel, H.R. Alloy, High Speed, W 6.75, Cr 4.5, V 2.1, Mo 5.5, C 0.060 (lb)	1.400	Strip, C.R., Carbon (lb)	9.489
Bars, Tool Steel, H.R., Alloy, High Speed, W18, Cr 4, V 1 (lb)	1.895	Strip, C.R., Stainless, 430 (lb)	0.480
Bars, H.R., Alloy (lb)	10.775	Strip, H.R., Carbon (lb)	6.250
Bars, H.R., Stainless, 303 (lb)	0.543	Pipe, Black, Buttweld (100 ft)	19.905
Bars, H.R., Carbon (lb)	6.675	Pipe, Galv., Buttweld (100 ft)	23.253
		Pipe, Line (100 ft)	199.53
		Casing, Oil Well, Carbon (100 ft)	201.080
		Casing, Oil Well, Alloy (100 ft)	315.213
		Tubes, Boiler (100 ft)	51.200
		Tubing, Mechanical, Carbon (100 ft)	27.005
		Tubing, Mechanical, Stainless, 304 (100 ft)	207.515
		Tin Plate, Hot-dipped, 1.25 lb (95 lb base box)	10.100
		Tin Plate, Electrolytic, 0.25 lb (95 lb base box)	8.800
		Black Plate, Canmaking Quality (95 lb base box)	7.900
		Wire, Drawn, Carbon	10.575
		Wire, Drawn, Stainless, 430 (lb)	0.685
		Bale Ties (bundles)	7.967
		Nails, Wire, 8d Common	9.825
		Wire, Barbed (80-rod spool)	8.719
		Woven Wire Fence (20-rod roll)	21.737

STEEL's FINISHED STEEL PRICE INDEX*

	April 8 1959	Week Ago	Month Ago	Year Ago	5 Yr Ago
Index (1935-39 avg=100)	247.82	247.82	247.82	239.15	189.74
Index in cents per lb	6.713	6.713	6.713	6.479	5.140

STEEL's ARITHMETICAL COMPOSITES*

Finished Steel, NT	$149.96	$149.96	$149.96	$145.42	$113.70
No. 2 Fdry, Pig Iron, GT	66.49	66.49	66.49	66.49	56.54
Basic Pig Iron, GT	65.99	65.99	65.99	65.99	56.04
Malleable Pig Iron, GT	67.27	67.27	67.27	67.27	57.27
Steelmaking Scrap, GT	36.17	37.00	41.67	34.17	25.33

*For explanation of weighted index see STEEL, Sept. 19, 1949, p. 54; of arithmetical price composite, STEEL, Sept. 1, 1952, p. 130.

Comparison of Prices

Comparative prices by districts in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED STEEL	April 8 1959	Week Ago	Month Ago	Year Ago	5 Yr Ago
Bars, H.R., Pittsburgh	5.675	5.675	5.675	5.425	4.15
Bars, H.R., Chicago	5.675	5.675	5.675	5.425	4.15
Bars, H.R., deld., Philadelphia	5.975	5.975	5.975	5.725	4.405
Bars, C.F., Pittsburgh	7.65*	7.65*	7.65*	7.30*	5.20
Shapes, Std., Pittsburgh	5.50	5.50	5.50	5.275	4.10
Shapes, Std., Chicago	5.50	5.50	5.50	5.275	4.10
Shapes, deld., Philadelphia	5.77	5.77	5.77	5.545	4.38
Plates, Pittsburgh	5.30	5.30	5.30	5.10	4.10
Plates, Chicago	5.30	5.30	5.30	5.10	4.10
Plates, Coatesville, Pa.	5.30	5.30	5.30	5.10	4.10
Plates, Sparrows Point, Md.	5.30	5.30	5.30	5.10	4.10
Plates, Claymont, Del.	5.30	5.30	5.30	5.10	4.10
Sheets, H.R., Pittsburgh	5.10	5.10	5.10	4.925	3.925
Sheets, H.R., Chicago	5.10	5.10	5.10	4.925	3.925
Sheets, C.R., Pittsburgh	6.275	6.275	6.275	6.05	4.775
Sheets, C.R., Chicago	6.275	6.275	6.275	6.05	4.775
Sheets, C.R., Detroit	6.275	6.275	6.275	6.05-6.15	4.975
Sheets, Galv., Pittsburgh	6.875	6.875	6.875	6.60	5.275
Strip, H.R., Pittsburgh	5.10	5.10	5.10	4.925	4.425
Strip, H.R., Chicago	5.10	5.10	5.10	4.925	3.925
Strip, C.R., Pittsburgh	7.425	7.425	7.425	7.15	5.45
Strip, C.R., Chicago	7.425	7.425	7.425	7.15	5.70
Strip, C.R., Detroit	7.425	7.425	7.425	7.25	5.65
Wire, Basic, Pittsburgh	8.00	8.00	8.00	7.65	5.525
Nails, Wire, Pittsburgh	8.95	8.95	8.95	8.95	6.55
Tin plate (1.50 lb) box, Pitts.	$10.65	$10.65	$10.65	$10.30	$8.95

*Including 0.35c for special quality.

SEMIFINISHED STEEL					
Billets, forging, Pitts. (NT)	$99.50	$99.50	$99.50	$96.00	$75.50
Wire rods 7/32-9/32" Pitts.	6.40	6.40	6.40	6.15	4.525

PIG IRON, Gross Ton	April 8 1959	Week Ago	Month Ago	Year Ago	5 Yr Ago
Bessemer, Pitts.	$67.00	$67.00	$67.00	$67.00	$57.00
Basic, Valley	66.00	66.00	66.00	66.00	56.00
Basic, deld., Phila.	70.41	70.41	70.41	70.41	59.66
No. 2 Fdry, NevilleIsland, Pa.	66.50	66.50	66.50	66.50	56.50
No. 2 Fdry, Chicago	66.50	66.50	66.50	66.50	56.50
No. 2 Fdry, deld., Phila.	70.91	70.91	70.91	70.91	60.16
No. 2 Fdry, Birm.	62.50	62.50	62.50	62.50	52.88
No. 2 Fdry (Birm.) deld. Cin.	70.20	70.20	70.20	70.20	60.43
Malleable, Valley	66.50	66.50	66.50	66.50	56.50
Malleable, Chicago	66.50	66.50	66.50	66.50	56.50
Ferromanganese, net ton†	245.00	245.00	245.00	245.00	200.00

†74-76% Mn, Duquesne, Pa.

SCRAP, Gross Ton (including broker's commission)					
No. 1 Heavy Melt, Pittsburgh	$36.50	$36.50	$44.50	$33.50	$26.50
No. 1 Heavy Melt, E. Pa.	34.50	36.00	38.00	38.00	22.00
No. 1 Heavy Melt, Chicago	37.50	38.50	42.50	31.00	27.50
No. 1 Heavy Melt, Valley	40.50	40.50	45.50	33.50	24.50
No. 1 Heavy Melt, Cleve.	36.50	36.50	41.50	30.50	21.50
No. 1 Heavy Melt, Buffalo	34.50	39.50	39.50	28.50	23.50
Rails, Rerolling, Chicago	59.50	60.50	62.50	53.50	34.50
No. 1 Cast, Chicago	46.50	47.50	48.50	38.50	36.00

COKE, Net Ton					
Beehive, Furn., Connlsvl.	$15.00	$15.00	$15.00	$15.25	$14.75
Beehive, Fdry., Connlsvl.	18.25	18.25	18.25	18.25	16.75
Oven, Fdry., Milwaukee	32.00	32.00	32.00	30.50	25.25

Steel Prices

Mill Code prices as reported to STEEL, April 8, cents per pound except as otherwise noted. *Changes shown in italics.* number following mill point indicates producing company. Key to producers, page 151; footnotes, page 153.

SEMIFINISHED

INGOTS, Carbon, Forging (NT)
Munhall,Pa. U5 ..... $76.00

INGOTS, Alloy (NT)
Detroit S41 ..... $82.00
Ecomony,Pa. B14 ..... 82.00
Farrell,Pa. S3 ..... 82.00
Lowellville,O. S3 ..... 82.00
Midland,Pa. C18 ..... 82.00
Munhall,Pa. U5 ..... 82.00
Sharon,Pa. S3 ..... 82.00

BILLETS, BLOOMS & SLABS Carbon, Rerolling (NT)
Bartonville,Ill. K4 ..... $82.00
Bessemer,Pa. U5 ..... 80.00
Buffalo R2 ..... 80.00
Clairton,Pa. U5 ..... 80.00
Ensley,Ala. T2 ..... 80.00
Fairfield,Ala. T2 ..... 80.00
Fontana,Calif. K1 ..... 90.50
Gary,Ind. U5 ..... 80.00
Johnstown,Pa. B2 ..... 80.00
Lackawanna,N.Y. B2 ..... 80.00
Munhall,Pa. U5 ..... 80.00
Owensboro,Ky. G8 ..... 80.00
S.Chicago,Ill. R2, U5 ..... 80.00
S.Duquesne,Pa. U5 ..... 80.00
Sterling,Ill. N15 ..... 80.00
Youngstown R2 ..... 80.00

Carbon, Forging (NT)
Bessemer,Pa. U5 ..... $99.50
Buffalo R2 ..... 99.50
Canton,O. R2 ..... 102.00
Clairton,Pa. U5 ..... 99.50
Conshohocken,Pa. A3 ..... 104.50
Ensley,Ala. T2 ..... 99.50
Fairfield,Ala. T2 ..... 99.50
Farrell,Pa. S3 ..... 99.50
Fontana,Calif. K1 ..... 109.00
Gary,Ind. U5 ..... 99.50
Geneva,Utah C11 ..... 99.50
Houston S5 ..... 104.50
Johnstown,Pa. B2 ..... 99.50
Lackawanna,N.Y. B2 ..... 99.50
LosAngeles B3 ..... 109.00
Midland,Pa. C18 ..... 99.50
Munhall,Pa. U5 ..... 99.50
Owensboro, Ky. G8 ..... 99.50
Seattle B3 ..... 113.00
Sharon,Pa. S3 ..... 99.50
S.Chicago R2, U5, W14 ..... 99.50
S.Duquesne,Pa. U5 ..... 99.50
S.SanFrancisco B3 ..... 109.00
Warren,O. C17 ..... 99.50

Alloy, Forging (NT)
Bethlehem,Pa. B2 ..... $119.00
Bridgeport,Conn. C32 ..... 119.00
Buffalo R2 ..... 119.00
Canton,O. R2, T7 ..... 119.00
Conshohocken,Pa. A3 ..... 126.00
Detroit S41 ..... 119.00
Economy,Pa. B14 ..... 119.00
Farrell,Pa. S3 ..... 119.00
Fontana,Calif. K1 ..... 140.00
Gary,Ind. U5 ..... 119.00
Houston S5 ..... 124.00
Ind.Harbor,Ind. Y1 ..... 119.00
Johnstown,Pa. B2 ..... 119.00
Lackawanna,N.Y. B2 ..... 119.00
LosAngeles B3 ..... 139.00
Lowellville,O. S3 ..... 119.00
Massillon,O. R2 ..... 119.00
Midland,Pa. C18 ..... 119.00
Munhall,Pa. U5 ..... 119.00
Owensboro,Ky. G8 ..... 119.00
Sharon,Pa. S3 ..... 119.00
S.Chicago R2,U5,W14 ..... 119.00
S.Duquesne,Pa. U5 ..... 119.00
Struthers,O. Y1 ..... 119.00
Warren,O. C17 ..... 119.00

ROUNDS, SEAMLESS TUBE (NT)
Buffalo R2 ..... $122.50
Canton,O. R2 ..... 125.00
Cleveland R2 ..... 122.50
Gary,Ind. U5 ..... 122.50
S.Chicago/Ill. R2, W14 ..... 122.50
S.Duquesne,Pa. U5 ..... 122.50
Warren,O. C17 ..... 122.50

SKELP
Aliquippa,Pa. J5 ..... 5.05
Munhall,Pa. U5 ..... 5.05
Pittsburgh J5 ..... 5.05
Warren,O. R2 ..... 5.05
Youngstown R2, U5 ..... 5.05

WIRE RODS
AlabamaCity,Ala. R2 ..... 6.40
Aliquippa,Pa. J5 ..... 6.40
Alton,Ill. L1 ..... 6.60
Bartonville,Ill. K4 ..... 6.50
Buffalo W12 ..... 6.40
Cleveland A7 ..... 6.40
Donora,Pa. A7 ..... 6.40
Fairfield,Ala. T2 ..... 6.40
Houston S5 ..... 6.65
IndianaHarbor,Ind. Y1 ..... 6.40
Johnstown,Pa. B2 ..... 6.40
Joliet,Ill. A7 ..... 6.40
KansasCity,Mo. S5 ..... 6.65
Kokomo,Ind. C16 ..... 6.50
LosAngeles B3 ..... 7.20
Minnequa,Colo. C10 ..... 6.65
Monessen,Pa. P7 ..... 6.40
N.Tonawanda,N.Y. B11 ..... 6.40
Pittsburg,Calif. C11 ..... 7.20
Portsmouth,O. P12 ..... 6.40
Roebling,N.J. R5 ..... 6.50
S.Chicago,Ill. R2, W14 ..... 6.40
SparrowsPoint,Md. B2 ..... 6.50
Sterling,Ill.(1) N15 ..... 6.40
Sterling,Ill. N15 ..... 6.50
Struthers,O. Y1 ..... 6.40
Worcester,Mass. A7 ..... 6.70

STRUCTURALS

Carbon Steel Std. Shapes
AlabamaCity,Ala. R2 ..... 5.50
Aliquippa,Pa. J5 ..... 5.50
Atlanta A11 ..... 5.70
Bessemer,Ala. T2 ..... 5.50
Bethlehem,Pa. B2 ..... 5.55
Birmingham C15 ..... 5.50
Clairton,Pa. U5 ..... 5.50
Fairfield,Ala. T2 ..... 5.50
Fontana,Calif. K1 ..... 6.30
Gary,Ind. U5 ..... 5.50
Geneva,Utah C11 ..... 5.50
Houston S5 ..... 5.60
Ind.Harbor,Ind. I-2, Y1 ..... 5.50
Johnstown,Pa. B2 ..... 5.55
Joliet,Ill. P22 ..... 5.50
KansasCity,Mo. S5 ..... 5.60
Lackawanna,N.Y. B2 ..... 5.55
LosAngeles B3 ..... 6.20
Minnequa,Colo. C10 ..... 5.80
Munhall,Pa. U5 ..... 5.50
Niles,Calif. P1 ..... 6.25
Phoenixville,Pa. P4 ..... 5.55
Portland,Oreg. O4 ..... 6.25
Seattle B3 ..... 6.25
S.Chicago,Ill. U5; W14 ..... 5.50
S.SanFrancisco B3 ..... 6.15
Sterling,Ill. N15 ..... 5.50
Torrance,Calif. C11 ..... 6.20
Weirton,W.Va. W6 ..... 5.50

Wide Flange
Bethlehem,Pa. B2 ..... 5.55
Clairton,Pa. U5 ..... 5.50
Fontana,Calif. K1 ..... 6.45
IndianaHarbor,Ind. I-2 ..... 5.50
Lackawanna,N.Y. B2 ..... 5.55
Munhall,Pa. U5 ..... 5.50
Phoenixville,Pa. P4 ..... 5.55
S.Chicago,Ill. U5 ..... 5.50
Sterling,Ill. N15 ..... 5.50
Weirton,W.Va. W6 ..... 5.50

Alloy Std. Shapes
Aliquippa,Pa. J5 ..... 6.80
Clairton,Pa. U5 ..... 6.80
Gary,Ind. U5 ..... 6.80
Houston S5 ..... 6.90
Munhall,Pa. U5 ..... 6.80
S.Chicago,Ill. U5, W14 ..... 6.80

H.S., L.A., Std. Shapes
Aliquippa,Pa. J5 ..... 8.05
Bessemer,Ala. T2 ..... 8.05
Bethlehem,Pa. B2 ..... 8.10
Clairton,Pa. U5 ..... 8.05
Fairfield,Ala. T2 ..... 8.05
Fontana,Calif. K1 ..... 8.85
Gary,Ind. U5 ..... 8.05
Geneva,Utah C11 ..... 8.05
Houston S5 ..... 8.15
Ind.Harbor,Ind. I-2, Y1 ..... 8.05
Johnstown,Pa. B2 ..... 8.10
KansasCity,Mo. S5 ..... 8.15
Lackawanna,N.Y. B2 ..... 8.10
LosAngeles B3 ..... 8.75
Munhall,Pa. U5 ..... 8.05
Seattle B3 ..... 8.80
S.Chicago,Ill. U5, W14 ..... 8.05
S.SanFrancisco B3 ..... 8.70
Sterling,Ill. N15 ..... 7.75
Struthers,O. Y1 ..... 8.05

H.S., L.A., Wide Flange
Bethlehem,Pa. B2 ..... 8.10
Ind.Harbor,Ind. I-2 ..... 8.05
Lackawanna,N.Y. B2 ..... 8.10
Munhall,Pa. U5 ..... 8.05
S.Chicago,Ill. U5 ..... 8.05
Sterling,Ill. N15 ..... 7.75

PILING

BEARING PILES
Bethlehem,Pa. B2 ..... 5.55
Ind.Harbor,Ind. I-2 ..... 5.50
Lackawanna,N.Y. B2 ..... 5.55
Munhall,Pa. U5 ..... 5.50
S.Chicago,Ill. I-2, U5 ..... 5.50

STEEL SHEET PILING
Ind.Harbor,Ind. I-2 ..... 6.50
Lackawanna,N.Y. B2 ..... 6.50
Munhall,Pa. U5 ..... 6.50
S.Chicago,Ill. I-2, U5 ..... 6.50
Weirton,W.Va. W6 ..... 6.50

PLATES

PLATES, Carbon Steel
AlabamaCity,Ala. R2 ..... 5.30
Aliquippa,Pa. J5 ..... 5.30
Ashland,Ky.(15) A10 ..... 5.30
Atlanta A11 ..... 5.50
Bessemer,Ala. T2 ..... 5.30
Clairton,Pa. U5 ..... 5.30
Claymont,Del. C22 ..... 5.30
Cleveland J5, R2 ..... 5.30
Coatesville,Pa. L7 ..... 5.30
Conshohocken,Pa. A3 ..... 5.30
Ecorse,Mich. G5 ..... 5.30
Fairfield,Ala. T2 ..... 5.30
Farrell,Pa. S3 ..... 5.30
Fontana,Calif.(30) K1 ..... 6.10
Gary,Ind. U5 ..... 5.30
Geneva,Utah C11 ..... 5.30
GraniteCity,Ill. G4 ..... 5.40
Harrisburg,Pa. P4 ..... 5.30
Houston S5 ..... 5.40
Ind.Harbor,Ind. I-2, Y1 ..... 5.30
Johnstown,Pa. B2 ..... 5.30
Lackawanna,N.Y. B2 ..... 5.30
Mansfield,O. E6 ..... 5.30
Minnequa,Colo. C10 ..... 6.15
Munhall,Pa. U5 ..... 5.30
Newport,Ky. A2 ..... 5.30
Pittsburgh J5 ..... 5.30
Riverdale,Ill. A1 ..... 5.30
Seattle B3 ..... 6.20
Sharon,Pa. S3 ..... 5.30
S.Chicago,Ill. U5, W14 ..... 5.30
SparrowsPoint,Md. B2 ..... 5.30
Sterling,Ill. N15 ..... 5.30
Steubenville,O. W10 ..... 5.30
Warren,O. R2 ..... 5.30
Youngstown U5, Y1 ..... 5.30
Youngstown(27) R2 ..... 5.30

PLATES, Carbon Abras. Resist.
Claymont,Del. C22 ..... 7.05
Fontana,Calif. K1 ..... 7.85
Geneva,Utah C11 ..... 7.05
Houston S5 ..... 7.15
Johnstown,Pa. B2 ..... 7.05
SparrowsPoint,Md. B2 ..... 7.05

PLATES, Wrought Iron
Economy,Pa. B14 ..... 13.55

PLATES, H.S., L.A.
Aliquippa,Pa. J5 ..... 7.95
Ashland,Ky. A10 ..... 7.95
Bessemer,Ala. T2 ..... 7.95
Clairton,Pa. U5 ..... 7.95
Claymont,Del. C22 ..... 7.95
Cleveland J5, R2 ..... 7.95
Coatesville,Pa. L7 ..... 7.95
Conshohocken,Pa. A3 ..... 7.95
Economy,Pa. B14 ..... 7.95
Ecorse,Mich. G5 ..... 7.95
Fairfield,Ala. T2 ..... 7.95
Farrell,Pa. S3 ..... 7.95
Fontana,Calif.(30) K1 ..... 8.75
Gary,Ind. U5 ..... 7.95
Geneva,Utah C11 ..... 7.95
Houston S5 ..... 8.05
Ind.Harbor,Ind. I-2, Y1 ..... 7.95
Johnstown,Pa. B2 ..... 7.95
Munhall,Pa. U5 ..... 7.95
Pittsburgh J5 ..... 7.95
Seattle B3 ..... 8.85
Sharon,Pa. S3 ..... 7.95
S.Chicago,Ill. U5, W14 ..... 7.95
SparrowsPoint,Md. B2 ..... 7.95
Warren,O. R2 ..... 7.95
Youngstown U5, Y1 ..... 7.95

PLATES, Alloy
Aliquippa,Pa. J5 ..... 7.50
Claymont,Del. C22 ..... 7.50
Coatesville,Pa. L7 ..... 7.50
Economy,Pa. B14 ..... 7.50
Farrell,Pa. S3 ..... 7.50
Fontana,Calif. K1 ..... 8.30
Gary,Ind. U5 ..... 7.50
Houston S5 ..... 7.60
Ind.Harbor,Ind. Y1 ..... 7.50
Johnstown,Pa. B2 ..... 7.50
Lowellville,O. S3 ..... 7.50
Munhall,Pa. U5 ..... 7.50
Newport,Ky. A2 ..... 7.50
Pittsburgh J5 ..... 7.50
Seattle B3 ..... 8.40
Sharon,Pa. S3 ..... 7.50
S.Chicago,Ill. U5, W14 ..... 7.50
SparrowsPoint,Md. B2 ..... 7.50
Youngstown Y1 ..... 7.50

FLOOR PLATES
Cleveland J5 ..... 6.375
Conshohocken,Pa. A3 ..... 6.375
Ind.Harbor,Ind. I-2 ..... 6.375
Munhall,Pa. U5 ..... 6.375
Pittsburgh J5 ..... 6.375
S.Chicago,Ill. U5 ..... 6.375

PLATES, Ingot Iron
Ashland c.l.(15) A10 ..... 5.55
Ashland l.c.l.(15) A10 ..... 6.05
Cleveland c.l. R2 ..... 6.05
Warren,O. c.l. R2 ..... 6.05

BARS

BARS, Hot-Rolled Carbon (Merchant Quality)
Ala.City,Ala.(9) R2 ..... 5.675
Aliquippa,Pa. (9) J5 ..... 5.675
Alton,Ill. L1 ..... 5.875
Atlanta(9) A11 ..... 5.875
Bessemer,Ala.(9) T2 ..... 5.675
Birmingham(9) C15 ..... 5.675
Buffalo(9) R2 ..... 5.675
Canton,O (23) R2 ..... 6.15
Clairton,Pa.(9) U5 ..... 5.675
Cleveland(9) R2 ..... 5.675
Ecorse,Mich.(9) G5 ..... 5.675
Emeryville,Calif. J7 ..... 6.425
Fairfield,Ala.(9) T2 ..... 5.675
Fairless,Pa.(9) U5 ..... 5.825
Fontana,Calif.(9) K1 ..... 6.375
Gary,Ind.(9) U5 ..... 5.675
Houston(9) S5 ..... 5.925
Ind.Harbor(9) I-2, Y1 ..... 5.675
Johnstown,Pa.(9) B2 ..... 5.675
Joliet,Ill. P22 ..... 5.675
KansasCity,Mo.(9) S5 ..... 5.925
Lackawanna(9) B2 ..... 5.675
LosAngeles(9) B3 ..... 6.375
Massillon,O. (23) R2 ..... 6.15
Midland,Pa.(23) C18 ..... 6.025
Milton,Pa. M18 ..... 5.825
Minnequa,Colo. C10 ..... 6.125
Niles,Calif. P1 ..... 6.375
N.T'wan'a,N.Y.(23)B11 ..... 6.025
Owensboro,Ky.(9) G8 ..... 6.025
Pittsburg,Calif.(9) C11 ..... 6.375
Pittsburgh(9) J5 ..... 5.675
Portland,Oreg. O4 ..... 6.425
Riverdale,Ill.(9) A1 ..... 5.675
Seattle B3, N14 ..... 6.425
S.Ch'c'go(9)R2,U5,W14 ..... 5.675
S.Duquesne,Pa.(9) U5 ..... 5.675
S.SanFran.,Calif.(9) B3 ..... 6.425
Sterling,Ill.(1)(9) N15 ..... 5.675
Sterling,Ill.(9) N15 ..... 5.775
Struthers,O.(9) Y1 ..... 5.675
Tonawanda,N.Y. B12 ..... 5.675
Torrance,Calif.(9) C11 ..... 6.375
Warren,O. C17 ..... 6.025
Youngstown(9) R2, U5 ..... 5.675

BARS, Hot-Rolled Alloy
Aliquippa,Pa. J5 ..... 6.725
Bethlehem,Pa. B2 ..... 6.725
Bridgeport,Conn. C32 ..... 6.80
Buffalo R2 ..... 6.725
Canton,O. R2, T7 ..... 6.725
Clairton,Pa. U5 ..... 6.725
Detroit S41 ..... 6.725
Economy,Pa. B14 ..... 6.725
Ecorse,Mich. G5 ..... 6.725
Fairless,Pa. U5 ..... 6.875
Farrell,Pa. S3 ..... 6.725
Fontana,Calif. K1 ..... 7.775
Gary,Ind. U5 ..... 6.725
Houston S5 ..... 6.975
Ind.Harbor,Ind. I-2, Y1 ..... 6.725
Johnstown,Pa. B2 ..... 6.725
KansasCity,Mo. S5 ..... 6.975
Lackawanna,N.Y. B2 ..... 6.725
LosAngeles B3 ..... 7.775
Lowellville,O. S3 ..... 6.725
Massillon,O. R2 ..... 6.725
Midland,Pa. C18 ..... 6.725
Owensboro,Ky. G8 ..... 6.725
Pittsburgh J5 ..... 6.725
Sharon,Pa. S3 ..... 6.725
S.Chicago R2, U5, W14 ..... 6.725
S.Duquesne,Pa. U5 ..... 6.725
Struthers,O. Y1 ..... 6.725
Warren,O. C17 ..... 6.725
Youngstown U5 ..... 6.725

BARS & SMALL SHAPES, H.R. High-Strength, Low-Alloy
Aliquippa,Pa. J5 ..... 8.30
Bessemer,Ala. T2 ..... 8.30
Bethlehem,Pa. B2 ..... 8.30
Clairton,Pa. U5 ..... 8.30
Cleveland R2 ..... 8.30
Ecorse,Mich. G5 ..... 8.30
Fairfield,Ala. T2 ..... 8.30
Fontana,Calif. K1 ..... 9.00
Gary,Ind. U5 ..... 8.30
Houston S5 ..... 8.55
Ind.Harbor,Ind. Y1 ..... 8.30
Johnstown,Pa. B2 ..... 8.30
KansasCity,Mo. S5 ..... 8.55
Lackawanna,N.Y. B2 ..... 8.30
LosAngeles B3 ..... 9.00
Pittsburgh J5 ..... 8.30
Seattle B3 ..... 9.05
S.Chicago,Ill. R2, W14 ..... 8.30
S.Duquesne,Pa. U5 ..... 8.30
S.SanFrancisco B3 ..... 9.05
Struthers,O. Y1 ..... 8.30
Youngstown U5 ..... 8.30

BAR SIZE ANGLES; H.R. Carbon
Bethlehem,Pa.(9) B2 ..... 5.825
Houston(9) S5 ..... 5.925
KansasCity,Mo.(9) S5 ..... 5.925
Lackawanna(9) B2 ..... 5.675
Sterling,Ill. N15 ..... 5.775
Sterling,Ill.(1) N15 ..... 5.675
Tonawanda,N.Y. B12 ..... 5.675

BAR SIZE ANGLES; S. Shapes
Aliquippa,Pa. J5 ..... 5.675
Atlanta A11 ..... 5.875
Joliet,Ill. P22 ..... 5.675
Minnequa,Colo. C10 ..... 6.125
Niles,Calif. P1 ..... 6.375
Pittsburgh J5 ..... 5.675
Portland,Oreg. O4 ..... 6.425
SanFrancisco S7 ..... 6.52
Seattle B3 ..... 6.425

BAR SHAPES, Hot-Rolled Alloy
Aliquippa,Pa. J5 ..... 6.80
Clairton,Pa. U5 ..... 6.80
Gary,Ind. U5 ..... 6.80
Houston S5 ..... 7.05
KansasCity,Mo. S5 ..... 7.05
Pittsburgh J5 ..... 6.80
Youngstown U5 ..... 6.80

BARS, C.F. Leaded (Including leaded extra)

Carbon
LosAngeles P2, S30 ..... 11.75*

Alloy
Ambridge,Pa. W18 ..... 10.175
BeaverFalls,Pa. M12 ..... 10.175
Camden,N.J. P13 ..... 10.35
Chicago W18 ..... 10.175
Elyria,O. W8 ..... 10.175
Monaca,Pa. S17 ..... 10.175
Newark,N.J. W18 ..... 10.35
SpringCity,Pa. K3 ..... 10.35

*Grade A; add 0.05c for Grade B.

BARS, Cold-Finished Carbon
Ambridge,Pa. W18 ..... 7.65
BeaverFalls,Pa. M12,R2 ..... 7.65
Birmingham C15 ..... 8.25
Buffalo B5 ..... 7.70
Camden,N.J. P13 ..... 8.10
Carnegie,Pa. C12 ..... 7.65
Chicago W18 ..... 7.65
Cleveland A7, C20 ..... 7.65
Detroit B5, P17 ..... 7.85
Detroit S41 ..... 7.65
Donora,Pa. A7 ..... 7.65
Elyria,O. W8 ..... 7.65
FranklinPark,Ill. N5 ..... 7.65
Gary,Ind. R2 ..... 7.65
GreenBay,Wis. F7 ..... 7.65
Hammond,Ind. J5, L2 ..... 7.65
Hartford,Conn. R2 ..... 8.15
Harvey,Ill. B5 ..... 7.65
LosAngeles(49) S30 ..... 9.10
LosAngeles(49) P2, R2 ..... 9.10
Mansfield,Mass. B2 ..... 8.20
Massillon,O. R2, R8 ..... 7.65
Midland,Pa. C18 ..... 7.65
Monaca,Pa. S17 ..... 7.65
Newark,N.J. W18 ..... 8.10
NewCastle,Pa.(17) B4 ..... 7.65
Pittsburgh J5 ..... 7.65
Plymouth,Mich. P5 ..... 7.90
Putnam,Conn. W18 ..... 8.20
Readville,Mass. C14 ..... 8.20
S.Chicago,Ill. W14 ..... 7.65
SpringCity,Pa. K3 ..... 8.10
Struthers,O. Y1 ..... 7.65
Warren,O. C17 ..... 7.65
Waukegan,Ill. A7 ..... 7.65
Willimantic,Conn. J5 ..... 8.15
Youngstown F3, Y1 ..... 7.65

BARS, Cold-Finished Carbon (Turned and Ground)
Cumberland,Md.(5) C19 ..... 6.55

BARS, Cold-Finished Alloy
Ambridge,Pa. W18 ..... 9.025
BeaverFalls,Pa. M12,R2 ..... 9.025
Bethlehem,Pa. B2 ..... 9.025
Bridgeport,Conn. C32 ..... 9.175
Buffalo B5 ..... 9.025
Camden,N.J. P13 ..... 9.20
Canton,O. T7 ..... 9.025
Carnegie,Pa. C12 ..... 9.025
Chicago W18 ..... 9.025
Cleveland A7, C20 ..... 9.025
Detroit B5, P17 ..... 9.225
Detroit S41 ..... 9.025
Donora,Pa. A7 ..... 9.025
Elyria,O. W8 ..... 9.025
FranklinPark,Ill. N5 ..... 9.025
Gary,Ind. R2 ..... 9.025
GreenBay,Wis. F7 ..... 9.025
Hammond,Ind. J5, L2 ..... 9.025
Hartford,Conn. R2 ..... 9.325
Harvey,Ill. B5 ..... 9.025
Lackawanna,N.Y. B2 ..... 9.025
LosAngeles P2, S30 ..... 11.00
Mansfield,Mass. B5 ..... 9.325
Massillon,O. R2, R8 ..... 9.025
Midland,Pa. C18 ..... 9.025
Monaca,Pa. S17 ..... 9.025
Newark,N.J. W18 ..... 9.20
Plymouth,Mich. P5 ..... 9.225
S.Chicago,Ill. W14 ..... 9.025
SpringCity,Pa. K3 ..... 9.20
Struthers,O. Y1 ..... 9.025
Warren,O. C17 ..... 9.025
Waukegan,Ill. A7 ..... 9.025
Willimantic,Conn. J5 ..... 9.325
Worcester,Mass. A7 ..... 9.325
Youngstown F3, Y1 ..... 9.025

BARS, Reinforcing, Billet (To Fabricators)

AlabamaCity,Ala. R2 ..5.675
Atlanta A11 .....5.675
Birmingham C15 .....5.675
Buffalo R2 .....5.675
Cleveland R2 .....5.675
Ecorse,Mich. G5 .....5.675
Emeryville,Calif. J7 ..6.425
Fairfield,Ala. T2 .....5.675
Fairless,Pa. U5 .....5.825
Fontana,Calif. K1 ....6.375
Ft.Worth,Tex(4)(26)T4 5.925
Gary,Ind. U5 .....5.675
Houston S5 .....5.925
Ind.Harbor,Ind. I-2, Y1 5.675
Johnstown,Pa. B2 ....5.675
Joliet,Ill. P22 .....5.675
KansasCity,Mo. S5 ...5.925
Kokomo,Ind. C16 .....5.775
Lackawanna,N.Y. B2 ..5.675
LosAngeles B3 .....6.375
Madison,Ill. L1 .....5.875
Milton,Pa. M18 .....5.825
Minnequa,Colo. C10 ...6.125
Niles,Calif. P1 .....6.375
Pittsburg,Calif. C11 ..6.375
Pittsburgh J5 .....5.675
Portland,Oreg. O4 ....6.425
SandSprings,Okla. S5 ..5.925
Seattle B3, N14 .....6.425
S.Chicago,Ill. R2, W14 5.675
S.Duquesne,Pa. U5 ...5.675
S.SanFrancisco B3 ....6.425
SparrowsPoint,Md. B2 ..5.675
Sterling,Ill.(1) N15 ...5.675
Sterling,Ill. N15 .....5.775
Struthers,O. Y1 .....5.675
Tonawanda,N.Y. B12 ....6.10
Torrance,Calif. C11 ...6.375
Youngstown R2, U5 ..5.675

BARS, Reinforcing, Billet (Fabricated; To Consumers)

Baltimore B2 .....7.42
Boston B2, U8 .....8.15
Chicago U8 .....7.41
Cleveland U8 .....7.39
Houston S5 .....7.60
Johnstown,Pa. B2 .....7.33
KansasCity,Mo. S5 ....7.60
Lackawanna,N.Y. B2 ..7.35
Marion,O. P11 .....6.70
Newark,N.J. U8 .....7.80
Philadelphia U8 .....7.63
Pittsburgh J5, U8 ....7.35
SandSprings,Okla. S5 ..7.60
Seattle B3, N14 .....7.95
SparrowsPt.,Md. B2 ...7.33
St.Paul U8 .....8.17
Williamsport,Pa. S19 ...7.25

BARS, Wrought Iron

Economy,Pa.(S.R.)B14 14.90
Economy,Pa.(D.R.)B14 18.55
Economy(Staybolt)B14 19.00
McK.Rks.(S.R.) L5 ...14.50
McK.Rks.(D.R.) L5 ..19.80
McK.Rks.(Staybolt) L5 20.95

BARS, Rail Steel

ChicagoHts.(3) C2, I-2 5.575
ChicagoHts.(4) (44) I-2 5.675
ChicagoHts.(4) C2 ....5.675
Franklin,Pa. (3) F5 ...5.575
Franklin,Pa. (4) F5 ...5.675
JerseyShore,Pa.(3) J8 ..5.55
Marion,O.(3) P11 ....5.575
Tonawanda(3) B12 ...5.575
Tonawanda(4) B12 ....6.10

SHEETS

SHEETS, Hot-Rolled Steel (18 Gage and Heavier)

Lackawanna,N.Y. B2 ..5.10
Allenport,Pa. P7 .....5.10
Aliquippa,Pa. J5 .....5.10
Ashland,Ky.(8) A10 ...5.10
Cleveland J5, R2 .....5.10
Conshohocken,Pa. A3 ..5.15
Detroit(8) M1 .....5.10
Ecorse,Mich. G5 .....5.10
Fairfield,Ala. T2 .....5.10
Fairless,Pa. U5 .....5.15
Farrell,Pa. S3 .....5.10
Fontana,Calif. K1 ....5.825
Gary,Ind. U5 .....5.10
Geneva,Utah C11 .....5.20
GraniteCity,Ill.(8) G4 ..5.20
Ind.Harbor,Ind. I-2, Y1 5.10
Irvin,Pa. U5 .....5.10
Lackawanna,N.Y. B2 ..5.10
Mansfield,O. E6 .....5.10
Munhall,Pa. U5 .....5.10
Newport,Ky. A2 .....5.10
Niles,O. M21, S3 .....5.10
Pittsburg,Calif. C11 ....5.80
Pittsburgh J5 .....5.10
Portsmouth,O. P12 ....5.10
Riverdale,Ill. A1 .....5.10
Sharon,Pa. S3 .....5.10
S.Chicago,Ill. U5, W14 ..5.10
SparrowsPoint,Md. B2 ..5.10
Steubenville,O. W10 ....5.10
Warren,O. R2 .....5.10
Weirton,W.Va. W6 ....5.10
Youngstown U5, Y1 ....5.10

SHEETS, H.R. (19 Ga. & Lighter)

Niles,O. M21, S3 .....6.275

SHEETS, H.R., Alloy

Gary,Ind. U5 .....8.40
Ind.Harbor,Ind. Y1 ....8.40
Irvin,Pa. U5 .....8.40
Munhall,Pa. U5 .....8.40
Newport,Ky. A2 .....8.40
Youngstown U5, Y1 ....8.40

SHEETS, H.R.(14 Ga. & Heavier) High-Strength, Low-Alloy

Aliquippa,Pa. J5 .....7.525
Ashland,Ky. A10 .....7.525
Cleveland J5, R2 .....7.525
Conshohocken,Pa. A3 ..7.575
Ecorse,Mich. G5 .....7.525
Fairfield,Ala. T2 .....7.525
Fairless,Pa. U5 .....7.575
Farrell,Pa. S3 .....7.525
Fontana,Calif. K1 ....8.25
Gary,Ind. U5 .....7.525
Ind.Harbor,Ind. I-2, Y1 7.525
Irvin,Pa. U5 .....7.525
Lackawanna(35) B2 ...7.525
Munhall,Pa. U5 .....7.525
Niles,O. S3 .....7.525
Pittsburgh J5 .....7.525
S.Chicago,Ill. U5, W14 7.525
Sharon,Pa. S3 .....7.525
SparrowsPoint(36) B2 ..7.525
Warren,O. R2 .....7.525
Weirton,W.Va. W6 ....7.525
Youngstown U5, Y1 ....7.525

SHEETS, Hot-Rolled Ingot Iron (18 Gage and Heavier)

Ashland,Ky.(8) A10 ...5.35
Cleveland R2 .....5.875
Warren,O. R2 .....5.875

SHEETS, Cold-Rolled Ingot Iron

Cleveland R2 .....7.05
Middletown,O. A10 ....6.775
Warren,O. R2 .....7.05

SHEETS, Cold-Rolled Steel (Commercial Quality)

AlabamaCity,Ala. R2 ..6.275
Allenport,Pa. P7 .....6.275
Aliquippa,Pa. J5 .....6.275
Cleveland J5, R2 .....6.275
Conshohocken,Pa. A3 ..6.325
Detroit M1 .....6.275
Ecorse,Mich. G5 .....6.275
Fairfield,Ala. T2 .....6.275
Fairless,Pa. U5 .....6.325
Follansbee,W.Va. F4 ..6.275
Fontana,Calif. K1 ....7.40
Gary,Ind. U5 .....6.275
GraniteCity,Ill. G4 ....6.375
Ind.Harbor,Ind. I-2, Y1 6.275
Irvin,Pa. U5 .....6.275
Lackawanna,N.Y. B2 ..6.275
Mansfield,O. E6 .....6.275
Middletown,O. A10 ....6.275
Newport,Ky. A2 .....6.275
Pittsburg,Calif. C11 ....7.225
Pittsburgh J5 .....6.275
Portsmouth,O. P12 ....6.275
SparrowsPoint,Md. B2..6.275
Steubenville,O. W10 ...6.275
Warren,O. R2 .....6.275
Weirton,W.Va. W6 ....6.275
Yorkville,O. W10 .....6.275
Youngstown Y1 .....6.275

SHEETS, Cold-Rolled, High-Strength, Low-Alloy

Allquippa,Pa. J5 .....9.275
Cleveland J5, R2 .....9.275
Ecorse,Mich. G5 .....9.275
Fairless,Pa. U5 .....9.325
Fontana,Calif. K1 ....10.40
Gary,Ind. U5 .....9.275
Ind.Harbor,Ind. I-2, Y1 9.275
Lackawanna(37) B2 ..9.275
Pittsburgh J5 .....9.275
SparrowsPoint(38) B2..9.275
Warren,O. R2 .....9.275
Weirton,W.Va. W6 ....9.275
Youngstown Y1 .....9.275

SHEETS, Culvert

	Cu Steel	Cu Fe
Ala.City,Ala. R2	7.225	....
Ashland,Ky. A10	7.225	7.475
Canton,O. R2	7.225	7.75
Fairfield T2	7.225	7.475
Gary,Ind. U5	7.225	7.475
GraniteCity,Ill.G4	7.325	....
Ind.Harbor I-2	7.225	7.475
Irvin,Pa. U5	7.225	7.475
Kokomo,Ind. C16	7.325	....
MartinsFry. W10	7.225	7.475
Pitts.,Calif. C11	7.975	....
Pittsburgh J5	7.225	....
SparrowsPt. B2	7.225	....

SHEETS, Culvert—Pure Iron

Ind.Harbor,Ind. I-2 ...7.475

SHEETS, Galvanized Steel Hot-Dipped

AlabamaCity,Ala. R2 .6.875‡
Ashland,Ky. A10 ....6.875†
Canton,O. R2 .....6.875‡
Dover,O. E6 .....6.875†
Fairfield,Ala. T2 ....6.875†
Gary,Ind. U5 .....6.875†
GraniteCity,Ill. G4 ...6.975*
Ind.Harbor,Ind. I-2 ..6.875†
Irvin,Pa. U5 .....6.875†
Kokomo,Ind. C16 .....6.975†
MartinsFerry,O. W10 ..6.875*
Middletown,O. A10 ...6.875†
Pittsburg,Calif. C11 ..7.625*
Pittsburgh J5 .....6.875†
SparrowsPt.,Md. B2 ..6.875†
Warren,O. R2 .....6.875†
Weirton,W.Va. W6 ....6.875*

*Continuous and noncontinuous. †Continuous. ‡Noncontinuous.

SHEETS, Well Casing

Fontana,Calif. K1 ....7.325

SHEETS, Galvanized High-Strength, Low-Alloy

Irvin,Pa. U5 .....10.125
Pittsburgh J5 .....10.125
SparrowsPt.(39) B2 ..10.025

SHEETS, Galvannealed Steel

Canton,O. R2 .....7.275
Irvin,Pa. U5 .....7.275

SHEETS, Galvanized Ingot Iron (Hot-Dipped Continuous)

Ashland,Ky. A10 .....7.125
Middletown,O. A10 ....7.125

SHEETS, Electrogalvanized

Cleveland(28) B2 .....7.65
Niles,O.(28) R2 .....7.65
Weirton,W.Va. W6 ....7.50
Youngstown J5 .....7.50

SHEETS, Aluminum Coated

Butler,Pa. A10 (type 1) 9.525
Butler,Pa. A10 (type 2) 9.625

SHEETS, Enameling Iron

Ashland,Ky. A10 .....6.775
Cleveland R2 .....6.775
Fairfield,Ala. T2 .....6.775
Gary,Ind. U5 .....6.775
GraniteCity,Ill. G4 ....6.875
Ind.Harbor,Ind. I-2, Y1 6.775
Irvin,Pa. U5 .....6.775
Middletown,O. A10 ....6.775
Niles,O. M21, S3 .....6.775
Youngstown Y1 .....6.775

BLUED STOCK, 29 Gage

Dover,O. E6 .....8.70
Follansbee,W.Va. F4 ...8.70
Ind.Harbor,Ind. I-2 ....8.70
Mansfield,O. E6 .....8.70
Warren,O. R2 .....8.70
Yorkville,O. W10 .....8.70

SHEETS, Long Terne, Steel (Commercial Quality)

BeechBottom,W.Va.W10 7.225
Gary,Ind. U5 .....7.225
Mansfield,O. E6 .....7.225
Middletown,O. A10 ....7.225
Niles,O. M21, S3 .....7.225
Warren,O. R2 .....7.225
Weirton,W.Va. W6 ....7.225

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10 ....7.625

Key To Producers

A1 Acme Steel Co.
A2 Acme-Newport Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A5 Alloy Metal Wire Div., H. K. Porter Co. Inc.
A6 American Shim Steel Co.
A7 American Steel & Wire Div., U. S. Steel Corp.
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.
B1 Babcock & Wilcox Co.
B2 Bethlehem Steel Co.
B3 Beth. Pac. Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B8 Braeburn Alloy Steel
B9 Brainard Steel Div., Sharon Steel Corp.
B10 E. & G. Brooke, Wickwire Spencer Steel Div., Colo. Fuel & Iron
B11 Buffalo Bolt Co., Div., Buffalo Eclipse Corp.
B12 Buffalo Steel Corp.
B14 A. M. Byers Co.
B15 J. Bishop & Co.
C1 Calstrip Steel Corp.
C2 Calumet Steel Div., Borg-Warner Corp.
C4 Carpenter Steel Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia-Geneva Steel Div. U. S. Steel Corp.
C12 Columbia Steel & Shaft.
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft.
C15 Connors Steel Div., H. K. Porter Co. Inc.
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
C22 Claymont Plant, Wickwire Spencer Steel Div., Colo. Fuel & Iron
C23 Charter Wire Inc.
C24 G. O. Carlson Inc.
C32 Carpenter Steel of N.Eng.

D2 Detroit Steel Corp.
D4 Disston Div., H. K. Porter Co. Inc.
D6 Driver-Harris Co.
D7 Dickson Weatherproof Nail Co.
D8 Damascus Tube Co.
D9 Wilbur B. Driver Co.

E1 Eastern Gas&Fuel Assoc.
E2 Eastern Stainless Steel
E5 Elliott Bros. Steel Co.
E6 Empire-Reeves Steel Corp.
E10 Enamel Prod. & Plating

F2 Firth Sterling Inc.
F3 Fitzsimmons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div., Borg-Warner Corp.
F6 Fretz-Moon Tube Co.
F7 Ft. Howard Steel & Wire
F8 Ft. Wayne Metals Inc.

G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.
G8 Green River Steel Corp.

H1 Hanna Furnace Corp.
H7 Helical Tube Co.

I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div., Borg-Warner Corp.
I-6 Ivins Steel Tube Works
I-7 Indiana Steel & Wire Co.

J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel & Wire Co.
J5 Jones & Laughlin Steel
J6 Joslyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.

K1 Kaiser Steel Corp.
K2 Keokuk Electro-Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire
K7 Kenmore Metals Corp.

L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Steel Co.
L6 Lone Star Steel Co.
L7 Lukens Steel Co.
L8 Leschen Wire Rope Div., H. K. Porter Co. Inc.
M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M6 Mercer Pipe Div., Sawhill Tubular Products
M8 Mid-States Steel & Wire
M12 Moltrup Steel Products
M14 McInnes Steel Co.
M16 Md. Fine & Specialty Wire Co. Inc.
M17 Metal Forming Corp.
M18 Milton Steel Div., Merritt-Chapman&Scott
M21 Mallory-Sharon Metals Corp.
M22 Mill Strip Products Co.
N1 National-Standard Co.
N2 National Supply Co.
N3 National Tube Div., U. S. Steel Corp.
N5 Nelsen Steel & Wire Co.
N6 New England High Carbon Wire Co.
N8 Newman-Crosby Steel
N14 Northwest. Steel Rolling Mills Inc.
N15 Northwestern S.&W. Co.
N20 Neville Ferro Alloy Co.
O4 Oregon Steel Mills
P1 Pacific States Steel Corp.
P2 Pacific Tube Co.
P4 Phoenix Steel Corp., Sub. of Barium Steel Corp.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke & Chem.
P7 Pittsburgh Steel Co.
P11 Pollak Steel Co.
P12 Portsmouth Div., Detroit Steel Corp.
P13 Precision Drawn Steel
P14 Pitts. Screw & Bolt Co.
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., American Chain & Cable
P17 Plymouth Steel Corp.
P19 Pitts. Rolling Mills
P20 Prod. Steel Strip Corp.
P22 Phoenix Mfg. Co.
P24 Phil. Steel & Wire Corp.
R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R8 Reliance Div., Eaton Mfg.
R9 Rome Mfg. Co.
R10 Rodney Metals Inc.
S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S4 Sharon Tube Co.
S5 Sheffield Div., Armco Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S12 Spencer Wire Corp.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S17 Superior Drawn Steel Co.
S18 Superior Steel Div., Copperweld Steel Co.
S19 Sweet's Steel Co.
S20 Southern States Steel
S23 Superior Tube Co.
S25 Stainless Welded Prod.
S26 Specialty Wire Co. Inc.
S30 Sierra Drawn Steel Corp.
S40 Seneca Steel Service
S41 Stainless & Strip Div., J&L Steel Corp.
S42 Southern Elec. Steel Co.
S43 Seymour Mfg. Co.
T2 Tenn. Coal & Iron Div., U. S. Steel Corp.
T3 Tenn. Products & Chemical Corp.
T4 Texas Steel Co.
T5 Thomas Strip Div., Pittsburgh Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div., Am. Rad. & Stan. San.
T13 Tube Methods Inc.
T19 Techalloy Co. Inc.
U3 Union Wire Rope Corp.
U4 Universal-Cyclops Steel
U5 United States Steel Corp.
U6 U. S. Pipe & Foundry
U7 Ulbrich Stainless Steels
U8 U. S. Steel Supply Div., U. S. Steel Corp.
U11 Union Carbide Metals Co.
U13 Union Steel Corp.
V2 Vanadium-Alloys Steel
V3 Vulcan-Kidd Steel Div., H. K. Porter Co.
W1 Wallace Barnes Steel Div., Associated Spring Corp.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W8 Western Automatic Machine Screw Co.
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div., International Harvester
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.
Y1 Youngstown Sheet & Tube

STRIP

STRIP, Hot-Rolled Carbon

Ala.City,Ala.(27) R2	5.10
Allenport,Pa. P7	5.10
Alton,Ill. L1	5.30
Ashland,Ky.(8) A10	5.10
Atlanta A11	5.10
Bessemer,Ala. T2	5.10
Birmingham C15	5.10
Buffalo(27) R2	5.10
Conshohocken,Pa. A3	5.15
Detroit M1	5.10
Ecorse,Mich. G5	5.10
Fairfield,Ala. T2	5.10
Farrell,Pa. S3	5.10
Fontana,Calif. K1	5.825
Gary,Ind. U5	5.10
Ind.Harbor,Ind. I-2, Y1	5.10
Johnstown,Pa.(25) B2	5.10
Lackawanna,N.Y.(25) B2	5.10
LosAngeles(25) B3	5.85
LosAngeles C1	8.60
Minnequa,Colo. C10	6.20
Riverdale,Ill. A1	5.10
SanFrancisco S7	6.60
Seattle (25) B3	6.10
Seattle N14	6.60
Sharon,Pa. S3	5.10
S.Chicago W14	5.10
S.SanFrancisco(25) B3	5.85
SparrowsPoint,Md. B2	5.10
Torrance,Calif. C11	5.85
Warren,O. R2	5.10
Weirton,W.Va. W6	5.10
Youngstown U5	5.10

STRIP, Hot-Rolled Alloy

Carnegie,Pa. S18	8.40
Farrell,Pa. S3	8.40
Gary,Ind. U5	8.40
Houston S5	8.65
Ind.Harbor,Ind. Y1	8.40
KansasCity,Mo. S5	8.65
LosAngeles B3	9.60
Lowellville,O. S3	8.40
Newport,Ky. A2	8.40
Sharon,Pa. A2, S3	8.40
S.Chicago,Ill. W14	8.40
Youngstown U5, Y1	8.40

STRIP, Hot-Rolled High-Strength, Low-Alloy

Ashland,Ky. A10	7.575
Bessemer,Ala. T2	7.575
Conshohocken,Pa. A3	7.575
Ecorse,Mich. G5	7.575
Fairfield,Ala. T2	7.575
Farrell,Pa. S3	7.575
Gary,Ind. U5	7.575
Ind.Harbor,Ind. I-2, Y1	7.575
Lackawanna,N.Y. B2	7.575
LosAngeles(25) B3	8.325
Seattle(25) B3	8.575
Sharon,Pa. S3	7.575
S.Chicago,Ill. W14	7.575
S.SanFrancisco(25) B3	8.325
SparrowsPoint,Md. B2	7.575
Warren,O. R2	7.575
Weirton,W.Va. W6	7.575
Youngstown U5, Y1	7.575

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky.(8) A10	5.35
Warren,O. R2	5.875

STRIP, Cold-Rolled Carbon

Anderson,Ind. G6	7.425
Baltimore T6	7.425
Boston T6	7.975
Buffalo S40	7.425
Cleveland A7, J5	7.425
Dearborn,Mich. S3	7.425
Detroit D2, M1, P20	7.425
Dover,O. G6	7.425
Evanston,Ill. M22	7.525
Farrell,Pa. S3	7.425
Follansbee,W.Va. F4	7.425
Fontana,Calif. K1	9.20
FranklinPark,Ill. T6	7.525
Ind.Harbor,Ind. Y1	7.425
Indianapolis S41	7.575
LosAngeles C1, S41	9.30
McKeesport,Pa. E10	7.525
NewBedford,Mass. R10	7.875
NewBritain,Conn. S15	7.875
NewCastle,Pa. B4, E5	7.425
NewHaven,Conn. D2	7.875
NewKensington,Pa. A6	7.425
Pawtucket,R.I. R3	7.975
Pawtucket,R.I. N8	7.975
Philadelphia P24	7.875
Pittsburgh J5	7.425
Riverdale,Ill. A1	7.525
Rome,N.Y.(32) R6	7.425
Sharon,Pa. S3	7.425
Trenton,N.J.(31) R5	8.875
Wallingford,Conn. W2	7.875
Warren,O. R2, T5	7.425
Worcester,Mass. A7	7.975
Youngstown S41, Y1	7.425

STRIP, Cold-Rolled Alloy

Boston T6	15.90
Carnegie,Pa. S18	15.55
Cleveland A7	15.55
Dover,O. G6	15.55
Farrell,Pa. S3	15.55
FranklinPark,Ill. T6	15.55
Harrison,N.J. C18	15.55
Indianapolis S41	15.70
LosAngeles S41	17.75
Lowellville,O. S3	15.55
Pawtucket,R.I. N8	15.90
Riverdale,Ill. A1	15.55
Sharon,Pa. S3	15.55
Worcester,Mass. A7	15.85
Youngstown S41, Y1	7.425

STRIP, Cold-Rolled High-Strength, Low-Alloy

Cleveland A7	10.80
Dearborn,Mich. S3	10.80
Dover,O. G6	10.80
Farrell,Pa. S3	10.80
Ind.Harbor,Ind. Y1	10.80
Sharon,Pa. S3	10.80
Warren,O. R2	10.80

STRIP, Cold-Finished Spring Steel (Annealed)	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Baltimore T6	9.50	10.70	12.90	15.90	18.85
Boston T6	9.50	10.70	12.90	15.90	18.85
Bristol,Conn. W1	...	10.70	12.90	16.10	19.30
Carnegie,Pa. S18	8.95	10.40	12.60	15.60	....
Cleveland A7	8.95	10.40	12.60	15.60	18.55
Dearborn,Mich. S3	9.05	10.50	12.70	....	....
Detroit D2	9.05	10.50	12.70	15.70	....
Dover,O. G6	8.95	10.40	12.60	15.60	18.55
Evanston,Ill. M22	8.95	10.40	12.60	15.60	....
Farrell,Pa. S3	8.95	10.40	12.60	15.60	18.55
Fostoria,O. S1	10.05	10.40	12.60	15.60	....
FranklinPark,Ill. T6	9.05	10.40	12.60	15.60	18.55
Harrison,N.J. C18	....	....	12.90	16.10	19.30
Indianapolis S41	9.10	10.55	12.60	15.60	18.55
LosAngeles C1	11.15	12.60	14.80	17.80	....
LosAngeles S41	11.15	12.60	14.80	....	....
NewBritain,Conn. S15	9.40	10.70	12.90	15.90	18.85
NewCastle,Pa. B4, E5	8.95	10.40	12.60	15.60	....
NewHaven,Conn. D2	9.40	10.70	12.90	15.90	....
NewKensington,Pa. A6	9.85	10.40	12.60	15.60	....
New York W3	...	10.70	12.90	16.10	19.30
Pawtucket,R.I. N8	9.50	10.70	12.90	15.90	18.85
Riverdale,Ill. A1	9.05	10.40	12.60	15.60	18.55
Rome,N.Y.(32) R6	8.95	10.40	12.60	15.60	18.55
Sharon,Pa. S3	8.95	10.40	12.60	15.60	18.55
Trenton,N.J. R5	...	10.70	12.90	15.90	18.85
Wallingford,Conn. W2	9.40	10.70	12.90	15.90	18.75
Warren,O. T5	8.95	10.40	12.60	15.60	18.55
Worcester,Mass. A7, T6	9.50	10.70	12.90	15.90	18.85
Youngstown S41	8.95	10.40	12.60	15.60	18.55

Spring Steel (Tempered)	Up to 0.80C	0.81-1.05C	1.06-1.35C
Bristol,Conn. W1	...	18.85	22.95	27.80
Buffalo W12	...	18.85	...	....
Fostoria,O. S1	...	19.05	22.15	....
FranklinPark,Ill. T6	...	19.20	23.30	28.15
Harrison,N.J. C18	...	18.85	22.95	27.80
New York W3	...	18.85	22.95	27.80
Palmer,Mass. W12	...	18.85	...	....
Trenton,N.J. R5	...	18.85	22.95	27.80
Worcester,Mass. A7, T6	...	18.85	22.95	27.80
Youngstown S41	...	19.20	23.30	28.15

STRIP, Galvanized (Continuous)

Farrell,Pa. S3	7.50
Sharon,Pa. S3	7.50

TIGHT COOPERAGE HOOP

Atlanta A11	5.65
Farrell,Pa. S3	5.525
Riverdale,Ill. A1	5.675
Sharon,Pa. S3	5.525
Youngstown U5	5.525

STRIP, Cold-Rolled Ingot Iron

Warren,O. R2	8.175

STRIP, C.R. Electrogalvanized

Cleveland A7	7.425*
Dover,O. G6	7.425*
Evanston,Ill. M22	7.525*
McKeesport,Pa. E10	7.50*
Riverdale,Ill. A1	7.525*
Warren,O. B9, S3, T5	7.425*
Worcester,Mass. A7	7.975
Youngstown S41	7.425*

*Plus galvanizing extras.

TIN MILL PRODUCTS

TIN PLATE, Electrolytic (Base Box)	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$9.10	$9.35	$9.75
Fairfield,Ala. T2	9.20	9.45	9.85
Fairless,Pa. U5	9.20	9.45	9.85
Fontana,Calif. K1	9.75	10.00	10.40
Gary,Ind. U5	9.10	9.35	9.75
GraniteCity,Ill. G4	9.20	9.45	9.60
IndianaHarbor,Ind. I-2, Y1	9.10	9.35	9.75
Irvin,Pa. U5	9.10	9.35	9.75
Niles,O. R2	9.10	9.35	9.75
Pittsburg,Calif. C11	9.75	10.00	10.40
SparrowsPoint,Md. B2	9.10	9.35	9.75
Weirton,W.Va. W6	9.10	9.35	9.75
Yorkville,O. W10	9.10	9.35	9.75

ELECTROLYTIC TIN-COATED SHEET (Dollars per 100 lb)			
Aliquippa,Pa. J5 (21-27 Ga.)	7.90	8.10	....
IndianaHarbor,Ind. Y1 (20-27 Ga.)	7.90	....	....
Niles,O. R2 (20-27 Ga.)	7.90	8.10	8.30

TIN PLATE, American	1.25 lb	1.50 lb
Aliquippa,Pa. J5	$10.40	$10.65
Fairfield,Ala. T2	10.50	10.75
Fairless,Pa. U5	10.50	10.75
Fontana,Calif. K1	11.05	11.30
Gary,Ind. U5	10.40	10.65
Ind.Harb. Y1	10.40	10.65
Pitts.,Calif. C11	11.05	11.30
Sp.Pt.,Md. B2	10.40	10.65
Weirton,W.Va. W6	10.40	10.65
Yorkville,O. W10	10.40	10.65

BLACK PLATE (Base Box)	
Aliquippa,Pa. J5	$8.20
Fairfield,Ala. T2	8.30
Fairless,Pa. U5	8.30
Fontana,Calif. K1	8.85
Gary,Ind. U5	8.20
GraniteCity,Ill. G4	8.30
Ind.Harbor,Ind. I-2, Y1	8.20
Irvin,Pa. U5	8.20
Niles,O. R2	8.20
Pittsburg,Calif. C11	8.85
SparrowsPoint,Md. B2	8.20
Weirton,W.Va. W6	8.20
Yorkville,O. W10	8.20

HOLLOWARE ENAMELING

Black Plate (29 Gage)	
Aliquippa,Pa. J5	7.85
Gary,Ind. U5	7.85
GraniteCity,Ill. G4	7.95
Ind.Harbor,Ind. Y1	7.85
Irvin,Pa. U5	7.85
Yorkville,O. W10	7.85

MANUFACTURING TERNES

(Special Coated, Base Box)	
Gary,Ind. U5	$10.05
Irvin,Pa. U5	10.05

SILICON STEEL

C.R. COILS & CUT LENGTHS (22 Ga.)

Fully Processed (Semiprocessed ½c lower)	Field	Armature	Electric	Motor	Dynamo
BeechBottom,W.Va. W10	....	11.70	12.40	13.55	14.65
Brackenridge,Pa. A4	....	....	12.40	13.55	14.65
GraniteCity,Ill. G4	9.975*	11.30*	12.00*	13.15*	....
IndianaHarbor,Ind. I-2	9.875*	11.20*	11.90*	13.05*	....
Mansfield,O. E6	9.875*	11.70	12.40	13.55	14.65
Newport,Ky. A2	9.875	11.70*	12.40*	13.55*	14.65*
Niles,O. M21	9.875*	11.70	12.40	13.55	....
Vandergrift,Pa. U5	9.875*	11.70	12.40	13.55	14.65
Warren,O. R2	9.875*	11.70	12.40	13.55	14.65
Zanesville,O. A10	....	11.70†	12.40	13.55	14.65

	Stator
Vandergrift,Pa. U5	8.10
Mansfield,O. E6	8.10
Warren,O. R2 (Silicon Lowcore)	8.10

SHEETS (22 Ga., coils & cut lengths) Fully Processed (Semiprocessed ½c lower)	T-72	T-65	T-58	T-52
BeechBottom,W.Va. W10	15.70	16.30	16.80	17.85
Vandergrift,Pa. U5	15.70	16.30	16.80	17.85
Zanesville,O. A10	15.70	16.30	16.80	17.85

C.R. COILS & CUT LENGTHS (22 Ga.)	Grain Oriented T-100	T-90	T-80	T-73	T-66	T
Brackenridge,Pa. A4	18.10	19.70	20.20	20.70	15.70††	
Butler,Pa. A10	....	....	19.70	20.20	20.70	....
Vandergrift,Pa. U5	17.10	18.10	19.70	20.20	20.70	15.70
Warren,O. R2	....	....	....	....	....	15.70‡

*Semiprocessed. †Fully processed only. ‡Coils, annealed, semiprocessed ½c lower. ††Coils only.

WIRE

WIRE, Manufacturers Bright, Low Carbon

AlabamaCity,Ala. R2	8.00
Aliquippa,Pa. J5	8.00
Alton,Ill. L1	8.20
Atlanta A1	8.00
Bartonville,Ill. K4	8.10
Buffalo W12	8.00
Chicago W13	8.00
Cleveland A7, C20	8.00
Crawfordsville,Ind. M8	8.10
Donora,Pa. A7	8.00
Duluth A7	8.00
Fairfield,Ala. T2	8.00
Fostoria,O.(24) S1	8.10
Houston S5	8.25
Jacksonville,Fla. M8	8.35
Johnstown,Pa. B2	8.00
Joliet,Ill. A7	8.00
KansasCity,Mo. S5	8.25
Kokomo,Ind. C16	8.10
LosAngles B3	8.95
Minequa,Colo. C10	8.25
Monessen,Pa. P7, P16	8.00
Palmer,Mass. W12	8.30
Pittsburg,Calif. C11	8.95
Portsmouth,O. P12	8.00
Rankin,Pa. A7	8.00
S.Chicago,Ill. R2	8.00
S.SanFrancisco C10	8.95
SparrowsPoint,Md. B2	8.10
Sterling,Ill.(1) N15	8.00
Sterling,Ill. N15	8.10
Struthers,O. Y1	8.00
Waukegan,Ill. A7	8.00
Worcester,Mass. A7	8.30

WIRE, Cold Heading Carbon

Elyria,O. W8	8.00

WIRE, Gal'd., for ACSR

Bartonville,Ill. K4	12.65
Buffalo W12	13.40
Cleveland A7	12.65
Donora,Pa. A7	12.65
Duluth A7	12.65
Johnstown,Pa. B2	13.40
KansasCity,Mo. U3	12.90
Minnequa,Colo. C10	12.775
Monessen,Pa. P7, P16	12.65
Muncie,Ind. I-7	13.60
NewHaven,Conn. A7	12.95
Palmer,Mass. W12	13.70
Pittsburg,Calif. C11	13.45
Portsmouth,O. P12	12.65
Roebling,N.J. R5	12.95
SparrowsPt.,Md. B2	13.50
Struthers,O. Y1	13.40
Trenton,N.J. A7	12.95
Waukegan,Ill. A7	12.65
Worcester,Mass. A7	12.95

WIRE, Upholstery Spring

Aliquippa,Pa. J5	9.75
Alton,Ill. L1	9.95
Buffalo W12	9.75
Cleveland A7	9.75
Donora,Pa. A7	9.75
Duluth A7	9.75
Johnstown,Pa. B2	9.75
KansasCity,Mo. S5, U3	10.00
LosAngeles B3	10.70
Minequa,Colo. C10	9.95
Monessen,Pa. P7, P16	9.75
NewHaven,Conn. A7	10.05
Palmer,Mass. W2	10.05
Pittsburg,Calif. C11	10.70
Portsmouth,O. P12	9.75
Roebling,N.J. R5	10.05
S.Chicago,Ill. R2	9.75
S.SanFrancisco C10	10.70
SparrowsPt.,Md. B2	9.85
Struthers,O. Y1	9.75
Trenton,N.J. A7	10.05
Waukegan,Ill. A7	9.75
Wor'ster,Mass.A7,J4,T6	10.05

WIRE, MB Spring, High-Carbon

Aliquippa,Pa. J5	9.75
Alton,Ill. L1	9.95
Bartonville,Ill. K4	9.85
Buffalo W12	9.75
Cleveland A7	9.75
Donora,Pa. A7	9.75
Duluth A7	9.75
Fostoria,O. S1	9.80
Johnstown,Pa. B2	9.75
KansasCity,Mo. S5, U3	10.00
LosAngeles B3	10.70
Milbury,Mass.(12) N6	10.05
Minnequa,Colo. C10	9.95
Monessen,Pa. P7, P16	9.75
Muncie,Ind. I-7	9.95
Palmer,Mass. W12	10.05
Pittsburg,Calif. C11	10.70
Portsmouth,O. P12	9.75
Roebling,N.J. R5	10.05
S.Chicago,Ill. R2	9.75
S.SanFrancisco C10	10.70
SparrowsPt.,Md. B2	9.85
Struthers,O. Y1	9.75
Trenton,N.J. A7	10.05
Waukegan,Ill. A7	9.75
Wor'ster,Mass.A7,J4,T6	10.05

WIRE, Fine & Weaving(8" Coils)

Alton,Ill. L1	16.50
Bartonville,Ill. K4	16.40
Chicago W13	16.30
Cleveland A7	16.30
Crawfordsville,Ind. M8	16.40
Fostoria,O. S1	16.30
Houston S5	16.55
Jacksonville,Fla. M8	16.65
Johnstown,Pa. B2	16.30
KansasCity,Mo. S5	16.55
Kokomo,Ind. C16	16.30
Minnequa,Colo. C10	16.55
Monessen,Pa. P16	16.30
Muncie,Ind. I-7	16.50
Palmer,Mass. W12	16.60
S.SanFrancisco C10	17.15
Waukegan,Ill. A7	16.30
Worcester,Mass. A7, J6	16.60

WIRE, Tire Bead

Bartonville,Ill. K4	17.15
Monessen,Pa. P16	17.15
Roebling,N.J. R5	17.65

ROPE WIRE	(A)
Bartonville,Ill. K4	13.45
Buffalo W12	13.45
Fostoria,O. S1	13.45
KansasCity,Mo. U3	13.70
Johnstown,Pa. B2	13.45
Monessen,Pa. P7	13.45
Muncie,Ind. I-7	13.65
Palmer,Mass. W12	13.75
Portsmouth,O. P12	13.45
Roebling,N.J. R5	13.75
St.Louis L8	13.45
SparrowsPt.,Md. B2	13.55
Struthers,O. Y1	13.45
Worcester,Mass. J4	13.75

(A) Plow and Mild Plow; add 0.25c for Improved Plow.

WIRE, Cold-Rolled Flat

Anderson,Ind. G6	12.35
Baltimore T6	12.65
Boston T6	12.65
Buffalo W12	12.35
Chicago W13	12.45
Cleveland A7	12.35
Crawfordsville,Ind. M8	12.35
Dover,O. G6	12.35
Farrell,Pa. S3	12.35
Fostoria,O. S1	12.35
FranklinPark,Ill. T6	12.45
Kokomo,Ind. C16	12.35
Massillon,O. R8	12.35
Milwaukee C23	12.55
Monessen,Pa. P7, P16	12.35
Palmer,Mass. W12	12.65
Pawtucket,R.I. N8	11.95
Philadelphia P24	12.65
Riverdale,Ill. A1	12.45
Rome,N.Y. R6	12.35
Sharon,Pa. S3	12.35
Trenton,N.J. R5	12.65
Warren,O. B9	12.35
Worcester,Mass. A7,T6	12.65

NAILS, Stock

	Col.
AlabamaCity,Ala. R2	173
Aliquippa,Pa. J5	173
Atlanta A11	175
Bartonville,Ill. K4	175
Chicago W13	173
Cleveland A9	173
Crawfordsville,Ind. M8	175
Donora,Pa. A7	173
Duluth A7	173
Fairfield,Ala. T2	173
Houston S5	178
Jacksonville,Fla. M8	175
Johnstown,Pa. B2	173
Joliet,Ill. A7	173
KansasCity,Mo. S5	178
Kokomo,Ind. C16	175
Minnequa,Colo. C10	178
Monessen,Pa. P7	173
Pittsburg,Calif. C11	192
Rankin,Pa. A7	173
S.Chicago,Ill. R2	173
SparrowsPt.,Md. B2	175
Sterling,Ill. (7) N15	175
Worcester,Mass. A7	179

(To Wholesalers; per cwt)

Galveston,Tex. D7	$10.30

NAILS, Cut (100 lb keg) To Distributors (33)

Wheeling,W.Va. W10	$10.10

POLISHED STAPLES

	Col.
AlabamaCity,Ala. R2	175
Aliquippa,Pa. J5	173
Atlanta A11	177
Bartonville,Ill. K4	175
Crawfordsville,Ind. M8	177
Donora,Pa. A7	173
Duluth A7	173
Fairfield,Ala. T2	173
Houston S5	180
Jacksonville,Fla. M8	177
Johnstown,Pa. B2	175
Joliet,Ill. A7	173
KansasCity,Mo. S5	180
Kokomo,Ind. C16	177
Minnequa,Colo. C10	180
Pittsburg,Calif. C11	194
Rankin,Pa. A7	173
S.Chicago,Ill. R2	175
SparrowsPt.,Md. B2	177
Sterling,Ill. (7) N15	175
Worcester,Mass. A7	181

TIE WIRE, Automatic Baler (14½ Ga.)(per 97 lb Net Box)

Coil No. 3150

AlabamaCity,Ala. R2	$9.24
Atlanta A11	10.36
Bartonville,Ill. K4	9.34
Buffalo W12	10.26
Chicago W13	9.24
Crawfordsville,Ind. M8	9.34
Donora,Pa. A7	9.24
Duluth A7	9.24
Fairfield,Ala. T2	9.24
Houston S5	10.51
Jacksonville,Fla. M8	9.34
Johnstown,Pa. B2	10.26
Joliet,Ill. A7	9.24
KansasCity,Mo. S5	10.51
Kokomo,Ind. C16	9.34
LosAngeles B3	11.05
Minnequa,Colo. C10	10.51
Pittsburg,Calif. C11	9.94
S.Chicago,Ill. R2	9.24
S.SanFrancisco C10	11.04
SparrowsPt.,Md. B2	10.36
Sterling,Ill. (37) N15	9.24

Coil No. 6500 Stand.

AlabamaCity,Ala. R2	$9.54
Atlanta A11	10.70
Bartonville,Ill. K4	9.64
Buffalo W12	10.60
Chicago W13	9.54
Crawfordsville,Ind. M8	9.64
Donora,Pa. A7	9.54
Duluth A7	9.54
Fairfield,Ala. T2	9.54
Houston S5	10.85
Jacksonville,Fla. M8	9.64
Johnstown,Pa. B2	10.60
Joliet,Ill. A7	9.54
KansasCity,Mo. S5	10.85
Kokomo,Ind. C16	9.64
LosAngeles B3	11.40
Minnequa,Colo. C10	10.85
Pittsburg,Calif. C11	10.26
S.Chicago,Ill. R2	9.54
S.SanFrancisco C10	11.40
SparrowsPt.,Md. B2	10.70
Sterling,Ill. (37) N15	9.54

Coil No. 6500 Interim

AlabamaCity,Ala. R2	$9.59
Atlanta A11	10.75
Bartonville,Ill. K4	9.69
Buffalo W12	10.65
Chicago W13	9.59
Crawfordsville,Ind. M8	9.69
Donora,Pa. A7	9.59
Duluth A7	9.59
Fairfield,Ala. T2	9.59
Houston S5	10.90
Jacksonville,Fla. M8	9.69
Johnstown,Pa. B2	10.65
Joliet,Ill. A7	9.59
KansasCity,Mo. S5	10.90
Kokomo,Ind. C16	9.69
LosAngeles B3	11.45
Minnequa,Colo. C10	10.90
Pittsburg,Calif. C11	10.31
S.Chicago,Ill. R2	9.59
S.SanFrancisco C10	11.45
SparrowsPt., Md. B2	10.75
Sterling,Ill. (37) N15	9.59

BALE TIES, Single Loop

	Col.
AlabamaCity,Ala. R2	212
Atlanta A11	214
Bartonville,Ill. K4	214
Crawfordsville,Ind. M8	214
Donora,Pa. A7	212
Duluth A7	212
Fairfield,Ala. T2	212
Houston S5	217
Jacksonville,Fla. M8	214
Joliet,Ill. A7	212
KansasCity,Mo. S5	217
Kokomo,Ind. C16	214
Minnequa,Colo. C10	217
Pittsburg,Calif. C11	236
S.SanFrancisco C10	236
SparrowsPt.,Md. B2	214
Sterling,Ill. (7) N15	214

FENCE POSTS

Birmingham C15	177
ChicagoHts.,Ill. C2, I-2	177
Duluth A7	177
Franklin,Pa. F5	177
Johnstown,Pa. B2	177
Marion,O. P11	177
Minnequa,Colo. C10	182
Tonawanda,N.Y. B12	177

WIRE, Barbed

	Col.
AlabamaCity,Ala. R2	193**
Aliquippa,Pa. J5	190§
Atlanta A11	198§
Bartonville,Ill. K4	198
Crawfordsville,Ind. M8	198
Donora,Pa. A7	193†
Duluth A7	193†
Fairfield,Ala. T2	193†
Houston S5	198**
Jacksonville,Fla. M8	198
Johnstown,Pa. B2	196§
Joliet,Ill. A7	193†
KansasCity,Mo. S5	198**
Kokomo,Ind. C16	195†
Minnequa,Colo. C10	198**
Monessen,Pa. P7	196§
Pittsburg,Calif. C11	213†
Rankin,Pa. A7	193†
S.Chicago,Ill. R2	193**
S.SanFrancisco C10	213*
SparrowsPoint,Md. B2	198§
Sterling,Ill.(7) N15	198††

WOVEN FENCE, 9-15 Ga.

	Col.
Ala.City,Ala. R2	187**
Aliq'ppa,Pa.9-11½ga.J5	190§
Atlanta A11	192§
Bartonville,Ill. K4	192
Crawfordsville,Ind. M8	192
Donora,Pa. A7	187†
Duluth A7	187†
Fairfield,Ala. T2	187†
Houston S5	192**
Jacksonville,Fla. M8	192
Johnstown,Pa.(43) B2	190§
Joliet,Ill. A7	187†
KansasCity,Mo. S5	192**
Kokomo,Ind. C16	189†
Minnequa,Colo. C10	192**
Pittsburg,Calif. C11	210†
Rankin,Pa. A7	187†
S.Chicago,Ill. R2	187**
Sterling,Ill.(7) N15	192††

WIRE (16 gage)

	An'ld Stone	Galv. Stone
Ala.City,Ala.R2	17.85	19.40**
Aliq'ppa,Pa. J5	17.85	19.65
Bartonville K4	17.95	19.80
Cleveland A7	17.85	....
Craw'dville M8	17.95	19.80†‡
Fostoria,O. S1	18.35	19.90†
Houston S5	18.10	19.65**
Jacksonville M8	17.95	19.80†‡
Johnstown B2	17.85	19.65§
Kan.City,Mo. S5	18.10	....
Kokomo C16	17.25	18.80†
Minnequa C10	18.10	19.65**
P'lm'r,Mass.W12	18.15	19.70†
Pitts.,Calif. C11	18.20	19.75†
S SanFran. C10	18 20	19.75**
St'ling(37) N15	17.25	19.05††
SparrowsPt. B2	17.95	19.75§
Waukegan A7	17.85	19.40†
Worcester A7	18.15	....

WIRE, Merchant Quality (6 to 8 gage)

	An'ld	Galv.
Ala.City,Ala. R2	9.00	9.55**
Aliquippa J5	8.65	9.325§
Atlanta(48)A11	9.10	9.775§
Bartonville(48) K4	9.10	9.80
Buffalo W12	9.00	9.55†
Cleveland A7	9.00	....
Crawfordsville M8	9.10	9.80†‡
Donora,Pa. A7	9.00	9.55†
Duluth A7	9.00	9.55†
Fairfield T2	9.00	9.55†
Houston(48) S5	9.25	9.80**
Jack'ville,Fla. M8	9.10	9.80†‡
Johnstown(48) B2	9.00	9.675§
Joliet,Ill. A7	9.00	9.55†
Kans.City(48) S5	9.25	9.80**
Kokomo(48) S16	9.10	9.65†
LosAngeles B3	9.95	10.625§
Monessen(48) P7	8.65	9.35§
Palmer,Mass. W12	9.30	9.85†
Pitts.,Calif. C11	9.95	10.50†
Rankin,Pa. A7	9.00	9.55†
S.Chicago R2	9.00	9.55**
S.SanFran. C10	9.95	10.50**
Spar'wsPt.(48)B2	9.10	9.775§
St'ling(1)(48)N15	9.00	9.70§§
Struthers,O. Y1	9.00	9.65†
Worcester,Mass.A7	9.30	9.85†

Based on zinc price of: *13.50. †5c. §10c. ‡Less than 10c. ††10.50c. ‡‡11.00c. **Subject to zinc equalization extras. §§11.50c.

FASTENERS

(Base discounts, shipments of one to four containers, per cent off list, f.o.b. mill)

BOLTS

Machine Bolts
Full Size Body (cut thread)

½ in. and smaller:	
3 in. and shorter	55.0
3¼ in. thru 6 in.	50.0
Longer than 6 in.	37.0
⅝ in., 3 in. & shorter	47.0
3¼ in. thru 6 in.	40.0
Longer than 6 in.	31.0
⅞ in. thru 1 in.:	
6 in. and shorter	37.0
Longer than 6 in.	31.0
1⅛ in. and larger:	
All lengths	31.0

Undersize Body (rolled thread)

½ in. and smaller:	
3 in. and shorter	55.0
3¼ in. thru 6 in.	50.0

Carriage Bolts
Full Size Body (cut thread)& Undersize Body (rolled thread)

½ in. and smaller:	
6 in. and shorter	48.0
Larger diameters and longer lengths	35.0

Lag, Plow, Tap, Blank, Step Elevator, Tire, and Fitting Up Bolts

½ in. and smaller:	
6 in. and shorter	48.0
Larger diameters and longer lengths	35.0

High Tensile Structural Bolts
(Reg. semifinished hex head bolts, heavy semifinished hex nuts. Bolts — High-carbon steel, heat treated. Spec. ASTM A-325, in bulk. Full keg quantity)

⅝ in. diam	50.0
¾ in. diam	47.0
⅞ and 1 in. diam.	43.0
1¼ and 1¾ in. diam	34.0

NUTS
(Keg or case quantity and over)

Square Nuts, Reg. & Heavy:

All sizes	56.0

(Full container)

Hex Nuts, Reg. & Heavy Hot Pressed & Cold Punched:

¾ in. and smaller	62.0
⅞ in. to 1⅛ in., incl.	56.0
1⅛ in. and larger	51.5

Hex Nuts, Semifinished, Heavy (Incl. Slotted):

¾ in. and smaller	62.0
⅞ in. to 1½ in. incl.	56.0
1⅝ in. and larger	51.5

Hex Nuts, Finished (Incl. Slotted and Castellated):

⅞ in. and smaller	65.0
1 in. to 1½ in., incl.	57.0
1⅝ in. and larger	51.5

Semifinished Hex Nuts, Reg. (Incl. Slotted):

⅝ in. and smaller	62.0
¾ in. to ⅞ in., incl.	65.0
1 in. to 1½ in., incl.	57.0
1⅝ in. and larger	51.5

CAP AND SETSCREWS
(Base discounts, packages, per cent off list, f.o.b. mill)

Hex Head Cap Screws, Coarse or Fine Thread, Bright:
6 in. and shorter:

⅝ in. and smaller	35.0
¾, ⅞, and 1 in.	16.0
Longer than 6 in.:	
⅝ in. and smaller	3.0
¾, ⅞, and 1 in.	+11.0

High Carbon, Heat Treated:
6 in. and shorter:

⅝ in. and smaller	20.0
¾, ⅞, and 1 in.	+ 5.0
Longer than 6 in.:	
⅝ in. and smaller	+19.0
¾, ⅞, and 1 in.	+39.0

Flat Head Cap Screws:

¾ in. and smaller, 6 in. and shorter	+85.0

Setscrews, Square Head, Cup Point, Coarse Thread:
Through 1 in. diam:

6 in. and shorter	+ 5.0
Longer than 6 in.	+29.0

RIVETS

F.o.b. Cleveland and/or freight equalized with Pittsburgh, f.o.b. Chicago and/or freight equalized with Birmingham except where equalization is too great.
Structural ½ in., larger 12.85
7/8 in. and smaller by 6 in. and shorter: 15.0%.

PRESTRESSED STRAND

(High strength, stress relieved; 7 wire uncoated. Net prices per 1000 ft, 40,000 lb and over)

	Standard Diameter, Inches 1/4	5/16	3/8	7/16	1/2
Alton,Ill. L1	$28.95	$43.40	$55.40	$73.00	$95.10
Buffalo W12	28.95	43.40	55.40	73.00	95.10
Cleveland A7	28.95	43.40	55.40	73.00	....
KansasCity,Mo. U3	29.85	43.40	55.40	73.00	95.10
Monessen,Pa. P16	32.15	48.20	61.55	81.10	105.65
NewHaven,Conn. A7	28.95	43.40	55.40	73.00	95.10
Pittsburg,Calif. C11	....	43.40	55.40	73.00	....
Pueblo,Colo. W12	28.95	43.40	55.40	73.00	95.10
Roebling,N.J. R5	28.95	43.40	55.40	73.00	95.10
SparrowsPoint,Md. B2	28.95	43.40	55.40	73.00	95.10
St.Louis L8	28.95	43.40	55.40	73.00	95.10
Waukegan,Ill. A7	28.95	43.40	55.40	73.00	95.10

RAILWAY MATERIALS

	Standard No. 1	Standard No. 2	Tee Rails All No. 2	Tee Rails 60 lb Under
Bessemer,Pa. U5	5.75	5.65	....	6.725
Ensley,Ala. T2	5.75	5.65	....	6.725
Fairfield,Ala. T2	....	....	....	6.725
Gary,Ind. U5	5.75	5.65	....	....
Huntington,W.Va. C15	....	....	....	6.725
Johnstown,Pa. B2	....	....	....	(16)6.725
Lackawanna,N.Y. B2	5.75	5.65	....	6.725
Minnequa,Colo. C10	5.75	5.65	....	7.225
Steelton,Pa. B2	5.75	5.65	....	....
Williamsport,Pa. S19	....	....	....	6.725

TIE PLATES

Fairfield,Ala. T2	6.875
Gary,Ind. U5	6.875
Lackawanna,N.Y. B2	6.875
Minnequa,Colo. C10	6.875
Seattle B3	7.025
Steelton,Pa. B2	6.875
Torrance,Calif. C11	6.875

JOINT BARS

Bessemer,Pa. U5	7.25
Fairfield,Ala. T2	7.25
Joliet,Ill. U5	7.25
Lackawanna,N.Y. B2	7.25
Minnequa,Colo. C10	7.25
Steelton,Pa. B2	7.25

AXLES

Ind.Harbor,Ind. S13	9.125
Johnstown,Pa. B2	9.125

TRACK BOLTS, Untreated

Cleveland R2	15.35
KansasCity,Mo. S5	15.35
Lebanon,Pa. B2	15.35
Minnequa,Colo. C10	15.35
Pittsburgh P14	14.75
Seattle B3	15.85

SCREW SPIKES

Lebanon,Pa. B2	15.10

STANDARD TRACK SPIKES

Fairfield,Ala. T2	9.75
Ind.Harbor,Ind. I-2,Y1	10.10
KansasCity,Mo. S5	10.10
Lebanon,Pa. B2	10.10
Minnequa,Colo. C10	10.10
Pittsburgh J5	10.10
Seattle B3	10.60
S.Chicago,Ill. R2	10.10
Struthers,O. Y1	10.10
Youngstown R2	10.10

Footnotes

(1) Chicago base.
(2) Angles, flats, bands.
(3) Merchant.
(4) Reinforcing.
(5) 1⅛ to under 1 7/16 in.; 1 7/16 to under 1 15/16 in., 6.70c; 1 15/16 to 8 in., inclusive, 7.05c.
(6) Chicago or Birm. base.
(7) Chicago base 2 cols. lower.
(8) 16 Ga. and heavier.
(9) Merchant quality; add 0.35c for special quality.
(10) Pittsburgh base.
(11) Cleveland & Pitts. base.
(12) Worcester, Mass., base.
(13) Add 0.25c for 17 Ga. & heavier.
(14) Gage 0.143 to 0.249 in.; for gage 0.142 and lighter, 5.80c.
(15) ⅜" and thinner.
(16) 40 lb and under.
(17) Flats only; 0.25 in. & heavier.
(18) To dealers.
(19) Chicago & Pitts. base.
(21) New Haven, Conn., base.
(22) Deld. San Francisco Bay area.
(23) Special quality.
(24) Deduct 0.05c, finer than 15 Ga.
(25) Bar mill bands.
(26) Deld. in mill zone, 6.295c.
(27) Bar mill sizes.
(28) Bonderized.
(29) Youngstown base.
(30) Sheared; for universal mill add 0.45c.
(31) Widths over ⅝ in.; 7.375c, for widths ⅝ in. and under by 0.125 in. and thinner.
(32) Buffalo base.
(33) To jobbers, deduct 20c.
(34) 9.60c for cut lengths.
(35) 72" and narrower.
(36) 54" and narrower.
(37) Chicago base, 10 points lower.
(38) 13 Ga. & lighter; 60" & narrower.
(39) 48" and narrower.
(40) Lighter than 0.035"; 0.035" and heavier, 0.25c higher.
(41) 9.10c for cut lengths.
(42) Mill lengths, f.o.b. mill; deld in mill zone or within switching limits, 5.635c.
(43) 9-14½ Ga.
(44) To fabricators.
(48) 6-7 Ga.
(49) 3½ in. and smaller rounds; 9.65c, over 3½ in. and other shapes.

SEAMLESS STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	2		2½		3		3½		4		5		6	
List Per Ft	37c		58.5c		76.5c		92c		$1.09		$1.48		$1.92	
Pounds Per Ft	3.68		5.82		7.62		9.20		10.89		14.81		19.18	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	+12.25	+27.25	+5.75	+22.5	+3.25	+20	+1.75	+18.5	+1.75	+18.5	+2	+18.75	0.5	+16.25
Ambridge, Pa. N2	+12.25		+5.75	....	+3.25	....	+1.75	....	+1.75	....	+2	....	0.5	....
Lorain, O. N3	+12.25	+27.25	+5.75	+22.5	+3.25	+20	+1.75	+18.5	+1.75	+18.5	+2	+18.75	0.5	+16.25
Youngstown Y1	+12.25	+27.25	+5.75	+22.5	+3.25	+20	+1.75	+18.5	+1.75	+18.5	+2	+18.75	0.5	+16.25

ELECTRIC STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Youngstown R2	+12.25	+27.25	+5.75	+22.5	+3.25	+20	+1.75	+18.5	+1.75	+18.5	+2	+18.75	0.5	+16.25

BUTTWELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	⅛		¼		⅜		½		¾		1		1¼	
List Per Ft	5.5c		6c		6c		8.5c		11.5c		17c		23c	
Pounds Per Ft	0.24		0.42		0.57		0.85		1.13		1.68		2.28	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	....	....	....	....	....	....	2.25	+13	5.25	+9	8.75	+4.5	11.25	+3.75
Alton, Ill. L1	....	....	....	....	....	....	0.25	+15	3.25	+11	6.75	+6.5	9.25	+5.75
Benwood, W. Va. W10	1.5	+25	+10.5	+34	+21	+42.5	2.25	+13	5.25	+9	8.75	+4.5	11.25	+3.75
Butler, Pa. F6	4.5	+22	+8.5	+32	+19.5	+41	....	....	....	....	....	....	....	....
Etna, Pa. N2	....	....	....	....	....	....	2.25	+13	5.25	+9	8.75	+4.5	11.25	+3.75
Fairless, Pa. N3	....	....	....	....	....	....	0.25	+15	3.25	+11	6.75	+6.5	9.25	+5.75
Fontana, Calif. K1	....	....	....	....	....	....	+10.75	+26	+7.75	+22	+4.25	+17.5	+1.75	+16.75
Indiana Harbor, Ind. Y1	....	....	....	....	....	....	1.25	+14	4.25	+10	7.75	+5.5	10.25	+6.25
Lorain, O. N3	....	....	....	....	....	....	2.25	+13	5.25	+9	8.75	+4.5	11.25	+3.75
Sharon, Pa. S4	4.5	+22	+8.5	+32	+19.5	+41	....	....	....	....	....	....	....	....
Sharon, Pa. M6	....	....	....	....	....	....	2.25	+13	5.25	+9	8.75	+4.5	11.25	+3.75
Sparrows Pt., Md. B2	2.5	+24	+10.5	+34	+21.5	+43	0.25	+15	3.25	+11	6.75	+6.5	9.25	+5.75
Wheatland, Pa. W9	4.5	+22	+8.5	+32	+19.5	+41	2.25	+13	5.25	+9	8.75	+4.5	11.25	+3.75
Youngstown R2, Y1	....	....	....	....	....	....	2.25	+13	5.25	+9	8.75	+4.5	11.25	+3.75

Size—Inches	1½		2		2½		3		3½		4	
List Per Ft	27.5c		37c		58.5c		76.5c		92c		$1.09	
Pounds Per Ft	2.72		3.68		5.82		7.62		9.20		10.89	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	11.75	+2.75	12.25	+2.25	13.75	+2.5	13.75	+2.5	3.25	+13.5	3.25	+13.5
Alton, Ill. L1	9.75	+4.75	10.25	+4.25	11.75	+4.5	11.75	+4.5	1.25	+15.5	1.25	+15.5
Benwood, W. Va. W10	11.75	+2.75	12.25	+2.25	13.75	+2.5	13.75	+2.5	3.25	+13.5	3.25	+13.5
Etna, Pa. N2	11.75	+2.75	12.25	+2.25	13.75	+2.5	13.75	+2.5	3.25	+13.5	3.25	+13.5
Fairless, Pa. N3	9.75	+4.75	10.25	+4.25	11.75	+4.5	11.75	+5.5	1.25	+15.5	1.25	+15.5
Fontana, Calif. K1	+1.25	+15.75	+0.75	+15.25	0.75	+15.5	0.75	+15.5	+9.75	+26.5	+9.75	+26.5
Indiana Harbor, Ind. Y1	10.75	+3.75	11.25	+3.25	12.75	+3.5	12.25	+3.5	2.25	+14.5	2.25	+14.5
Lorain, O. N3	11.75	+2.75	12.25	+2.25	13.75	+2.5	13.75	+3.5	....	....	....	....
Sharon, Pa. M6	11.75	+2.75	12.25	+2.25	13.75	+2.5	13.75	+2.5	....	....	....	....
Sparrows Pt., Md. B2	9.75	+4.75	10.25	+4.25	11.75	+4.5	11.75	+4.5	1.25	+15.5	1.25	+15.5
Wheatland, Pa. W9	11.75	+2.75	12.25	+2.25	13.75	+2.5	13.75	+2.5	3.25	+13.5	3.25	+13.5
Youngstown R2, Y1	11.75	+2.75	12.25	+2.25	13.75	+2.5	13.75	+2.5	3.25	+13.5	3.25	+13.5

*Galvanized pipe discounts based on price of zinc at 11.00c, East St. Louis.

Stainless Steel

Representative prices, cents per pound; subject to current lists of extras

AISI Type	—Rerolling— Ingot	Slabs	Forging Billets	H.R. Strip	H.R. Rods; C.F. Wire	Bars; Structural Shapes	Plates	Sheets	C.R. Strip; Flat Wire
201	22.75	28.00	....	36.00	....	43.50	39.25	48.50	45.00
202	24.75	31.50	37.75	39.00	42.25	44.50	40.00	49.25	49.25
301	24.00	29.00	38.75	37.25	43.50	46.00	41.25	51.25	47.50
302	26.25	32.75	39.50	40.50	44.25	46.75	42.25	52.00	52.00
302B	26.50	34.00	42.25	45.75	46.75	49.00	44.50	57.00	57.00
303	....	33.25	42.50	....	47.25	49.75	45.00	56.75	56.75
304	28.00	34.50	42.00	43.75	47.00	49.50	45.75	55.00	55.00
304L	....	....	49.75	51.50	54.75	57.25	53.50	62.75	62.75
305	29.50	38.25	44.00	47.50	47.00	49.50	46.25	58.75	58.75
308	32.00	39.75	49.00	50.25	54.75	57.75	55.25	63.00	63.00
309	41.25	51.25	60.00	64.50	66.25	69.50	66.00	80.50	80.50
310	51.50	63.75	81.00	84.25	89.75	94.50	87.75	96.75	96.75
314	....	....	80.50	....	89.75	94.50	87.75	....	104.25
316	41.25	51.25	64.50	68.50	71.75	75.75	71.75	80.75	80.75
316L	....	....	72.25	76.25	79.50	83.50	79.50	88.50	88.50
317	49.75	62.25	79.75	88.25	89.50	94.25	88.50	101.00	101.00
321	33.50	41.50	48.75	53.50	54.50	57.50	54.75	65.50	65.50
330	....	....	123.25	....	113.00	143.75	135.00	149.25	149.25
18-8 CbTa	38.50	48.25	57.75	63.50	63.75	67.25	64.75	79.25	79.25
403	....	....	29.25	....	33.25	35.00	30.00	40.25	40.25
405	20.25	26.50	30.75	36.00	34.75	36.50	32.50	46.75	46.75
410	17.50	22.25	29.25	31.00	33.25	35.00	30.00	40.25	40.25
416	....	....	29.75	....	33.75	35.50	31.25	48.25	48.25
420	....	34.75	35.50	41.75	40.75	42.75	40.25	62.00	62.00
430	17.75	22.50	29.75	32.00	33.75	35.50	31.00	40.75	40.75
430F	....	....	30.50	....	34.25	36.00	31.75	51.75	51.75
431	....	29.75	39.25	....	43.50	46.00	41.00	56.00	56.00
446	....	....	40.75	59.00	46.00	48.25	42.75	70.00	70.00

Stainless Steel Producers Are: Allegheny Ludlum Steel Corp.; American Steel & Wire Div., U. S. Steel Corp.; Anchor Drawn Steel Co., division of Vanadium-Alloys Steel Co.; Armco Steel Corp.; Babcock & Wilcox Co.; Bethlehem Steel Co.; J. Bishop & Co.; A. M. Byers Co.; G. O. Carlson Inc.; Carpenter Steel Co.; Carpenter Steel Co. of New England; Charter Wire Products; Crucible Steel Co. of America; Damascus Tube Co.; Dearborn Div., Sharon Steel Corp.; Wilbur B. Driver Co.; Driver-Harris Co.; Eastern Stainless Steel Corp.; Firth Sterling Inc.; Fort Wayne Metals Inc.; Green River Steel Corp., subsidiary of Jessop Steel Co.; Indiana Steel & Wire Co.; Ingersoll Steel Div., Borg-Warner Corp.; Ellwood Ivins Steel Tube Works Inc.; Jessop Steel Co.; Johnson Steel & Wire Co. Inc.; Stainless & Strip Div., Jones & Laughlin Steel Corp.; Joslyn Stainless Steels, division of Joslyn Mfg. & Supply Co.; Latrobe Steel Co.; Lukens Steel Co.; Maryland Fine & Specialty Wire Co. Inc.; McLouth Steel Corp.; Metal Forming Corp.; Midvale-Heppenstall Co.; National Standard Co.; National Tube Div., U. S. Steel Corp.; Pacific Tube Co.; Page Steel & Wire Div., American Chain & Cable Co. Inc.; Pittsburgh Rolling Mills Inc.; Republic Steel Corp.; Riverside-Alloy Metal Div., H. K. Porter Company, Inc.; Rodney Metals Inc.; Sawhill Tubular Products Inc.; Sharon Steel Corp.; Simonds Saw & Steel Co.; Specialty Wire Co. Inc.; Standard Tube Co.; Superior Steel Div., Copperweld Steel Co.; Superior Tube Co.; Swepco Tube Corp.; Techalloy Co. Inc.; Timken Roller Bearing Co.; Trent Tube Co., subsidiary of Crucible Steel Co. of America; Tube Methods Inc.; Ulbrich Stainless Steel Inc.; Union Steel Corp.; U. S. Steel Corp.; Universal Cyclops Steel Corp.; Vanadium-Alloys Steel Co.; Wall Tube & Metal Products Co.; Wallingford Steel, subsidiary, Allegheny Ludlum Steel Corp.; Washington Steel Corp.; Seymour Mfg. Co.

Clad Steel

	Plates—Carbon Base 5%	10%	15%	20%	Sheets Carbon Base 20%
Stainless					
302	....	....	....	....	37.50
304	26.05	28.80	31.55	34.30	39.75
304L	30.50	33.75	36.95	40.15	....
316	38.20	42.20	46.25	50.25	58.25
316L	42.30	46.75	51.20	55.65	....
316 Cb	49.90	55.15	60.40	65.65	....
321	31.20	34.50	37.75	41.05	47.25
347	36.90	40.80	44.65	48.55	57.00
405	22.25	24.60	26.90	29.25	....
410	20.55	22.70	24.85	27.00	....
430	21.20	23.45	25.65	27.90	....
Inconel	48.90	59.55	70.15	80.85	....
Nickel	41.65	51.95	63.30	72.70	....
Nickel, Low Carbon	41.95	52.60	63.30	74.15	....
Monel	43.35	53.55	63.80	74.05	....

	Strip, Carbon Base —Cold Rolled— 10%	Both Sides
Copper*	$36.20	$43.15

*Deoxidized. Production points: Stainless-clad sheets, New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. C22, Coatesville, Pa. L7, New Castle, Ind. I-4, and Washington, Pa. J3; nickel, inconel, monel-clad plates, Coatesville L7; copper-clad strip, Carnegie, Pa. S18.

Tool Steel

Grade	$ per lb	Grade	$ per lb
Reg. Carbon (W-1)	0.330	W-Cr Hot Work (H-12)	0.530
Spec. Carbon (W-1)	0.385	W Hot Wk. (H-21)	1.425-1.44
Oil Hardening (O-1)	0.505	V-Cr Hot Work (H-13)	0.550
V-Cr Hot Work (H-11)	0.505	Hi-Carbon-Cr (D-11)	0.955

Grade by Analysis (%) W	Cr	V	Co	Mo	AISI Designation	$ per lb
18	4	1	....	....	T-1	1.840
18	4	2	....	....	T-2	2.005
13.5	4	3	....	....	T-3	2.105
18.25	4.25	1	4.75	....	T-4	2.545
18	4	2	9	....	T-5	2.915
20.25	4.25	1.6	12.95	....	T-6	4.330
13.75	3.75	2	5	....	T-8	2.485
1.5	4	1	....	8.5	M-1	1.200
6.4	4.5	1.9	....	5	M-2	1.345
6	4	3	....	6	M-3	1.590

Tool steel producers include: A4, A8, B2, B8, C4, C9, C12, C18, F2, J3, L3, M14, S8, U4, V2, and V3.

Pig Iron

F.o.b. furnace prices in dollars per gross ton, as reported to STEEL. Minimum delivered prices are approximate.

	Basic	No. 2 Foundry	Malleable	Bessemer
Birmingham District				
Birmingham R2	62.00	62.50**	....	....
Birmingham U6	....	62.50**	66.50	....
Woodward,Ala. W15	62.00*	62.50**	66.50	....
Cincinnati, deld.	....	70.20	....	....
Buffalo District				
Buffalo H1, R2	66.00	66.50	67.00	67.50
N.Tonawanda,N.Y. T9	....	66.50	67.00	67.50
Tonawanda,N.Y. W12	66.00	66.50	67.00	67.50
Boston, deld.	77.29	77.79	78.29	....
Rochester,N.Y. deld.	69.02	69.52	70.02	....
Syracuse,N.Y., deld.	70.12	70.62	71.12	....
Chicago District				
Chicago I-3	66.00	66.50	66.50	67.00
S.Chicago,Ill. R2	66.00	66.50	66.50	67.00
S.Chicago,Ill. W14	66.00	....	66.50	67.00
Milwaukee, deld.	69.02	69.52	69.52	70.02
Muskegon,Mich., deld.	....	74.52	74.52	....
Cleveland District				
Cleveland R2, A7	66.00	66.50	66.50	67.00
Akron,Ohio, deld.	69.52	70.02	70.02	70.52
Mid-Atlantic District				
Birdsboro,Pa. B10	68.00	68.50	69.00	69.50
Chester,Pa. P4	68.00	68.50	69.00	....
Swedeland,Pa. A3	68.00	68.50	69.00	69.50
NewYork, deld.	....	75.50	76.00	....
Newark,N.J., deld.	72.69	73.19	73.69	74.19
Philadelphia, deld.	70.41	70.91	71.41	71.99
Troy,N.Y. R2	68.00	68.50	69.00	69.50
Pittsburgh District				
NevilleIsland,Pa. P6	66.00	66.50	66.50	67.00
Pittsburgh (N&S sides), Aliquippa, deld.	....	67.95	67.95	68.48
McKeesRocks,Pa., deld.	....	67.60	67.60	68.13
Lawrenceville,Homestead, Wilmerding,Monaca,Pa., deld.	....	68.26	68.26	68.79
Verona,Trafford,Pa., deld.	68.29	68.82	68.82	69.35
Brackenridge,Pa., deld.	68.60	69.10	69.10	69.63
Midland,Pa. C18	66.00	....	....	....
Youngstown District				
Hubbard,Ohio Y1	....	....	66.50	....
Sharpsville,Pa. S6	66.00	....	66.50	67.00
Youngstown Y1	....	....	66.50	....
Mansfield,Ohio, deld.	71.30	....	71.80	72.30

	Basic	No. 2 Foundry	Malleable	Bessemer
Duluth I-3	66.00	66.50	66.50	67.00
Erie,Pa. I-3	66.00	66.50	66.50	67.00
Everett,Mass. E1	67.50	68.00	68.50	....
Fontana,Calif. K1	75.00	75.50	....	....
Geneva,Utah C11	66.00	66.50	....	....
GraniteCity,Ill. G4	67.90	68.40	68.90	....
Ironton,Utah C11	66.00	66.50	....	....
Minnequa,Colo. C10	68.00	68.50	69.00	....
Rockwood,Tenn. T3	....	62.50‡	66.50	....
Toledo,Ohio I-3	66.00	66.50	66.50	67.00
Cincinnati, deld.	72.94	73.44	....	....

*Phos. 0.70-0.90%; Phos. 0.30-0.69%, $63.
**Phos. 0.70-0.90%; Phos. 0.30-0.69%, $63.50.
‡Phos. 0.50% up; Phos. 0.30-0.49%, $63.50.

PIG IRON DIFFERENTIALS

Silicon: Add 75 cents per ton for each 0.25% Si or percentage thereof over base grade, 1.75-2.25%, except on low phos. iron on which base is 1.75-2.00%.

Manganese: Add 50 cents per ton for each 0.25% manganese over 1% or portion thereof.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.01-6.50% silicon; add 75c for each 0.50% silicon or portion thereof over the base grade within a range of 6.50 to 11.50%; starting with silicon over 11.50% add $1.50 per ton for each 0.50% silicon or portion thereof up to 14%; add $1 for each 0.50% Mn over 1%)

Jackson,Ohio I-3, J1	$78.00
Buffalo H1	79.25

ELECTRIC FURNACE SILVERY IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1.25 for each 0.50% Mn over 1%; $2 per gross ton premium for 0.045% max P)

CalvertCity,Ky. P15	$99.00
NiagaraFalls,N.Y. P15	99.00
Keokuk,Iowa Open-hearth & Fdry, $9 freight allowed K2	103.50
Keokuk,Iowa O.H. & Fdry, 12½ lb piglets, 16% Si, max fr'gt allowed up to $9, K2	106.50

LOW PHOSPHORUS PIG IRON, Gross Ton

Lyles,Tenn. T3 (Phos. 0.035% max)	$73.00
Rockwood,Tenn. T3 (Phos. 0.035% max)	73.00
Troy,N.Y. R2 (Phos. 0.035% max)	73.00
Philadelphia, deld.	81.67
Cleveland A7 (Intermediate) (Phos. 0.036-0.075% max)	71.00
Duluth I-3 (Intermediate) (Phos. 0.036-0.075%)	71.00
Erie,Pa. I-3 (Intermediate) (Phos. 0.036-0.075% max)	71.00
NevilleIsland,Pa. P6 (Intermediate) (Phos. 0.036-0.075% max)	71.00

Steel Service Center Products

Representative prices, per pound, subject to extras, f.o.b. warehouse. City delivery charges are 15 cents per 100 lb except: Denver, Moline, Norfolk, Richmond, Washington, 20 cents; Baltimore, Boston, Los Angeles, New York, Philadelphia, Portland, Spokane, San Francisco, 10 cents; Atlanta, Birmingham, Chattanooga, Houston, Seattle, no charge.

	SHEETS				STRIP	BARS			Standard Structural	PLATES	
	Hot-Rolled	Cold-Rolled	Galv. 10 Ga.†	Stainless Type 302	Hot-Rolled*	H.R. Rounds	C.F. Rds.‡	H.R. Alloy 4140††[5]	Shapes	Carbon	Floor
Atlanta	8.59§	9.86§	10.13	....	8.91	9.39	13.24 #	....	9.40	9.29	11.21
Baltimore	8.55	9.25	9.99	....	9.05	9.45	11.85 #	15.48	9.55	9.00	10.50
Birmingham	8.18	9.45	10.46	....	8.51	8.99	....	....	9.00	8.89	10.90
Boston	10.07	11.12	11.92	53.50	12.17	10.19	13.30 #	15.64	10.64	10.27	11.95
Buffalo	8.40	9.60	10.85	55.98	8.75	9.15	11.45 #	15.40	9.25	9.20	10.75
Chattanooga	8.35	9.69	9.65	....	8.40	8.77	10.46	....	8.88	8.80	10.66
Chicago	8.25	9.45	10.90	53.00	8.51	8.99	9.15	15.05	9.00	8.89	10.20
Cincinnati	8.43	9.51	10.95	53.43	8.83	9.31	11.53 #	15.37	9.56	9.27	10.53
Cleveland	8.36	9.54	11.00	52.33	8.63	9.10	11.25 #	15.16	9.39	9.13	10.44
Dallas	8.80	9.30	....	....	8.85	8.80	....	....	8.75	9.15	10.40
Denver	9.40	11.84	12.94	....	9.43	9.80	11.19	....	9.84	9.76	11.08
Detroit	8.51	9.71	11.25	56.50	8.88	9.30	9.51	15.33	9.56	9.26	10.46
Erie, Pa.	8.35	9.45	9.95[10]	....	8.60	9.10	11.25	....	9.35	9.10	10.60
Houston	8.40	8.90	10.29	52.00	8.45	8.40	11.60	15.75	8.35	8.75	10.10
Jackson, Miss.	8.52	9.79	....	....	8.84	9.82	10.68	....	9.33	9.22	11.03
Los Angeles	8.70[2]	10.80[2]	12.20	57.60	9.15	9.10[2]	12.95[2]	16.35	9.00[2]	9.10[2]	11.30[2]
Memphis, Tenn.	8.59	9.80	....	....	8.84	9.32	11.25 #	....	9.33	9.22	10.86
Milwaukee	8.39	9.59	11.04	....	8.65	9.13	9.39	15.19	9.22	9.03	10.34
Moline, Ill.	8.55	9.80	....	....	8.84	8.95	9.15	....	8.99	8.91	....
New York	9.17	10.49	11.30	53.08	9.64	9.99	13.25 #	15.50	9.74	9.77	11.05
Norfolk, Va.	8.65	....	....	....	9.15	9.30	12.75	....	9.65	9.10	10.50
Philadelphia	8.20	9.25	10.61	52.71	9.25	9.40	11.95 #	15.48	9.10	9.15	10.40**
Pittsburgh	8.35	9.55	10.90	52.00	8.61	8.99	11.25 #	15.05	9.00	8.89	10.20
Richmond, Va.	8.65	....	10.79	....	9.15	9.55	....	....	9.65	9.10	10.60
St. Louis	8.63	9.83	11.28	....	8.89	9.37	9.78	15.43	9.48	9.27	10.58
St. Paul	8.79	10.04	11.49	....	8.84	9.21	9.86	....	9.38	9.30	10.49
San Francisco	9.65	11.10	11.40	55.10	9.75	10.15	13.60	16.25	9.85	10.00	12.35
Seattle	10.30	11.55	12.50	56.52	10.25	10.50	14.70	16.80[3]	10.20	10.10	12.50
South'ton, Conn.	9.07	10.33	10.71	....	9.48	9.74	....	....	9.57	9.57	10.91
Spokane	10.30	11.55	12.50	57.38	10.75	11.00	14.70	16.80	10.20	10.10	13.00
Washington	9.15	....	....	....	9.65	10.05	12.50	....	10.15	9.60	11.10

*Prices do not include gage extras; †prices include gage and coating extras; ‡includes 35-cent bar quality extras; §42 in. and under; **⅛ in. and heavier; ††as annealed; ‡‡¾ in. to 4 in. wide, inclusive; #net price, 1 in. round C-1018.

Base quantities, 2000 to 4999 lb except as noted; cold-finished bars, 2000 lb and over except in Seattle, 2000 to 3999 lb; stainless sheets, 8000 lb except in Chicago, New York, Boston, Seattle, 10,000 lb and in San Francisco, 2000 to 4999 lb; hot-rolled products on West Coast, 2000 to 9999 lb, except in Seattle, 30,000 lb and over; [2]—30,000 lb; [3]—1000 to 4999 lb; [5]—1000 to 1999 lb; [10]—2000 lb and over.

Refractories

Fire Clay Brick (per 1000 pieces*)

High-Heat Duty: Ashland, Grahn, Hayward, Hitchens, Haldeman, Olive Hill, Ky., Athens, Troup, Tex., Beech Creek, Clearfield, Curwensville, Lock Haven, Lumber, Orviston, West Decatur, Winburne, Snow Shoe, Pa., Bessemer, Ala., Farber, Mexico, St. Louis, Vandalia, Mo., Ironton, Oak Hill, Parrall, Portsmouth, Ohio, Ottawa, Ill., Stevens Pottery, Ga., Canon City, Colo., $140; Salina, Pa., $145; Niles, Ohio, $138; Cutler, Utah, $175.

Super-Duty: Ironton, Ohio, Vandalia, Mo., Olive Hill, Ky., Clearfield, Salina, Winburne, Snow Shoe, Pa., New Savage, Md., St. Louis, $185; Stevens Pottery, Ga., $195; Cutler, Utah, $248.

Silica Brick (per 1000 pieces*)

Standard: Alexandria, Claysburg, Mt. Union, Sproul, Pa., Ensley, Ala., Pt. Matilda, Pa., Portsmouth, Ohio, Hawstone, Pa., St. Louis, $158; Warren, Niles, Windham, Ohio, Hays, Latrobe, Morrisville, Pa., $163; E. Chicago, Ind., Joliet, Rockdale, Ill., $168; Canon City, Colo., $173; Lehi, Utah, $183; Los Angeles, $185.

Super-Duty: Sproul, Hawstone, Pa., Niles, Warren, Windham, Ohio, Leslie, Md., Athens, Tex., $158; Morrisville, Hays, Latrobe, Pa., $163; E. Chicago, Ind., St. Louis, $168; Curtner, Calif., $185; Canon City, Colo., $183.

Semisilica Brick (per 1000 pieces*)

Woodbridge, N. J., Canon City, Colo., $140; Philadelphia, Clearfield, Pa., $145.

Ladle Brick (per 1000 pieces*)

Dry Pressed: Alsey, Ill., Chester, New Cumberland, W. Va., Freeport, Johnstown, Merrill Station, Vanport, Pa., Mexico, Vandalia, Mo., Wellsville, Irondale, New Salisbury, Ohio, $96.75; Clearfield, Pa., Portsmouth, Ohio, $102.

High-Alumina Brick (per 1000 pieces*)

50 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., Danville, Ill., $253; Philadelphia, $265; Clearfield, Pa., $230; Orviston, Snow Shoe, Pa., $260.

60 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $310; Danville, Ill., $313; Clearfield, Orviston, Snow Shoe, Pa., $320; Philadelphia, $325.

70 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $350; Danville, Ill., $353; Clearfield, Orviston, Snow Shoe, Pa., $360; Philadelphia, $365.

Sleeves (per 1000)

Reesdale, Johnstown, Bridgeburg, St. Charles, Pa., St. Louis, $188; Ottawa, Ill., $205.

Nozzles (per 1000)

Reesdale, Johnstown, Bridgeburg, St. Charles, Pa., St. Louis, $310.

Runners (per 1000)

Reesdale, Johnstown, Bridgeburg, St. Charles, Pa., $234.

Dolomite (per net ton)

Domestic, dead-burned, bulk, Billmeyer, Blue Bell, Williams, Plymouth Meeting, York, Pa., Millville, W. Va., Bettsville, Millersville, Martin, Woodville, Gibsonburg, Narlo, Ohio, $16.75; Thornton, McCook, Ill., $17; Dolly Siding, Bonne Terre, Mo., $15.60.

Magnesite (per net ton)

Domestic, dead-burned, ¼ in. grains with fines: Chewelah, Wash., Luning, Nev., $46; ⅜ in grains with fines: Baltimore, $73.

*—9 in. x 4½ x 2.50 sts.

Fluorspar

Metallurgical grades, f.o.b. shipping point in Ill., Ky., net tons, carloads, effective CaF_2 content 72.5%, $37-$41; 70%, $36-$40; 60%, $33-$36.50. Imported, net ton, f.o.b. cars point of entry, duty paid, metallurgical grade; European, $30-$33, contract; Mexican, all rail, duty paid, $25; barge, Brownsville, Tex., $27.

Ores

Lake Superior Iron Ore

(Prices effective at start of the 1959 shipping season, subject to later revision, gross ton, 51.50% iron natural, rail of vessel, lower lake ports.)

Mesabi bessemer	$11.60
Mesabi nonbessemer	11.45
Old Range bessemer	11.85
Old Range nonbessemer	11.70
Open-hearth lump	12.70
High phos	11.45

The foregoing prices are based on upper lake rail freight rates, lake vessel freight rates, handling and unloading charges, and taxes thereon, which were in effect Jan. 1, 1959, and increases or decreases after that date are absorbed by the seller.

Eastern Local Iron Ore

Cents per unit, deld. E. Pa.

New Jersey, foundry and basic 62-64% concentrates	nom.

Foreign Iron Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 65%	23.00
N. African hematite (spot)	nom.
Brazilian iron ore, 68.5%	22.60

Tungsten Ore

Net ton, unit

Foreign wolframite, good commercial quality	$10.75-11.00*
Domestic, concentrates f.o.b. milling points	16.00-17.00†

*Before duty. †Nominal.

Manganese Ore

Mn 46-48%, Indian (export tax included) $0.915-$0.965 per long ton unit, c.i.f. U. S. ports, duty for buyer's account; other than Indian, nominal; contracts by negotiation.

Chrome Ore

Gross ton, f.o.b. cars New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., Tacoma, Wash.

Indian and Rhodesian

48% 3:1	$42.00-44.00
48% 2.8:1	38.00-40.00
48% no ratio	29.00-31.00

South African Transvaal

44% no ratio	19.75-21.00
48% no ratio	29.00-31.00

Turkish

48% 3:1	51.00-55.00

Domestic

Rail nearest seller

18% 3:1	39.00

Molybdenum

Sulfide concentrate, per lb of Mo content, mines, unpacked	$1.23

Antimony Ore

Per short ton unit of Sb content, c.i.f. seaboard	
50-55%	$2.25-2.40
60-65%	2.50-3.10

Vanadium Ore

Cents per lb V_2O_5

Domestic	31.00

Metal Powder

(Per pound f.o.b. shipping point in ton lots for minus 100 mesh, except as noted)

	Cents
Sponge Iron, domestic and foreign, 98% Fe: Minimum trucklots, freight allowed east of Mississippi River:	
100 mesh, 100 lb bags	11.25
100 mesh, 100 lb pails	9.10‡
40 mesh, 100 lb bags	8.10††
Electrolytic Iron, Melting stock, 99.87% Fe, irregular fragments of ⅛ in. x 1.3 in.	28.75
(In contract lots of 240 tons price is 22.75c)	
Annealed, 99.5% Fe	36.50
Unannealed (99 + % Fe)	36.00
Unannealed (99 + % Fe) (minus 325 mesh)	59.00
Powder Flake (minus 16, plus 100 mesh)	29.00
Carbonyl Iron: 98.1-99.9%, 3 to 20 microns, depending on grade, 93.00-290.00 in standard 200-lb containers; all minus 200 mesh	
Aluminum: Atomized, 500-lb drum, freight allowed Carlots	38.50
Ton lots	40.50
Antimony, 500-lb lots	42.00*
Brass, 5000-lb lots	34.40-50.90†
Bronze, 5000-lb lots	52.20-56.20†
Copper: Electrolytic	14.25*
Reduced	14.25*
Lead	7.50*
Manganese, Electrolytic: Minus 50 mesh	43.00
Nickel	80.60
Nickel-Silver, 5000-lb lots	52.80-57.20†
Phosphor-Copper, 5000-lb lots	64.60
Copper (atomized) 5000-lb lots	45.10-53.60†
Solder	7.00*
Stainless Steel, 304	$0.89
Stainless Steel, 316	$1.07
Tin	14.00*
Zinc, 5000-lb lots	19.00-32.20‡

Tungsten:	Dollars
Carbon reduced, 98.8% min, minus 65 mesh	nom.**
1000 lb	2.80
less 1000 lb	2.95
Chromium, electrolytic 99.8% Cr, min metallic basis	5.00

*Plus cost of metal. †Depending on composition. ‡Depending on mesh. §Cutting and scarfing grade. **Depending on price of ore. ††Welding grade.

Electrodes

Threaded with nipple; unboxed, f.o.b. plant

GRAPHITE

Inches Diam	Inches Length	Per 100 lb
2	24	$64.00
2½	30	41.50
3	40	39.25
4	40	37.00
5½	40	36.50
6	60	33.25
7	60	29.75
8, 9, 10	60	29.50
12	72	28.25
14	60	28.25
16	72	27.25
17	60	27.25
18	72	27.00
20	72	26.50
24	84	27.25

CARBON

8	60	14.25
10	60	13.80
12	60	14.75
14	60	14.75
14	72	12.55
17	60	12.65
17	72	12.10
20	90	11.55
24	72, 84	11.95
24	96	12.10
30	84	12.00
35, 40	110	11.60
40	100	12.50

Metallurgical Coke

Price per net ton

Beehive Ovens

Connellsville, Pa., furnace	$14.75-15.25
Connellsville, Pa., foundry	18.00-18.50

Oven Foundry Coke

Birmingham, ovens	$30.35
Cincinnati, deld.	33.34
Buffalo, ovens	32.00
Detroit, ovens	32.00
Pontiac, Mich., deld.	33.95
Saginaw, Mich., deld.	35.53
Erie, Pa., ovens	32.00
Everett, Mass., ovens: New England, deld.	33.55*
Indianapolis, ovens	31.25
Ironton, Ohio, ovens	30.50
Cincinnati, deld.	33.54
Kearny, N. J., ovens	31.25
Milwaukee, ovens	32.00
Neville Island (Pittsburgh), Pa., ovens	30.75
Painesville, Ohio, ovens	32.00
Cleveland, deld.	34.19
Philadelphia, ovens	31.00
St. Louis, ovens	33.00
St. Paul, ovens	31.25
Chicago, deld.	34.73
Swedeland, Pa., ovens	31.00
Terre Haute, Ind., ovens	31.25

*Within $5.15 freight zone from works.

Imported Steel

(Base per 100 lb, landed, duty paid, based on current ocean rates. Any increase in these rates is for buyer's account. Source of shipment: Western continental European countries.)

	North Atlantic	South Atlantic	Gulf Coast	West Coast
Deformed Bars, Intermediate, ASTM-A 305	$5.40	$5.40	$5.30	$5.75
Bar Size Angles	5.10	5.10	5.00	5.43
Structural Angles	5.10	5.10	4.90	5.43
I-Beams	5.11	5.11	5.01	5.45
Channels	5.06	5.06	4.96	5.40
Plates (basic bessemer)	6.37	6.37	6.37	6.69
Sheets, H.R.	8.25	8.25	8.25	8.55
Sheets, C.R. (drawing quality)	8.75	8.75	8.75	9.12
Furring Channels, C.R., 1000 ft, ¾ x 0.30 lb per ft	25.76	25.64	25.64	26.51
Barbed Wire (†)	6.55	6.55	6.55	6.90
Merchant Bars	5.35	5.35	5.30	5.85
Hot-Rolled Bands	7.15	7.15	7.15	7.55
Wire Rods, Thomas Commercial No. 5	5.19	5.32	5.14	5.49
Wire Rods, O.H. Cold Heading Quality No. 5	5.09	6.22	6.04	6.34
Bright Common Wire Nails (§)	7.85	7.75	7.67	8.20

†Per 82 lb net reel. §Per 100-lb kegs, 20d nails and heavier.

Coal Chemicals

(Representative prices)

Cents per gal. f.o.b. tank cars or tank trucks, plant.

Pure benzene	31.00
Xylene, industrial grade	29.00
Creosote	*24.00*
Naphthalene, 78 deg	5.00
Toluene, one deg (del. east of Rockies)	25.00

Cents per lb, f.o.b. tank cars or tank trucks, del.

Phenol, 90 per cent grade	15.50

Per net ton bulk, f.o.b. cars or trucks, plant

Ammonium sulfate, regular grade	$32.00

LOOKING FOR

LARGE NUTS?

Then contact Acimet, your dependable source for large nuts, milled from the bar! A large stock of full and jam size nuts starting at 1½ inches are constantly maintained in all standards. Extremely high concentricity is maintained by means of the automatic screw machine method. Any thread size, right or left hand. Commercial steel, SAE 1045 and SAE 4140.

FREE
LARGE NUT
BUYERS GUIDE

Send for your copy of the Acimet large nut buyers guide. Contains complete specifications and prices on Acimet heavy semi-finished and new finished hex nuts milled from the bar.

ACIMET MFG. CO.

1446 ROCKWELL AVE. • CLEVELAND 14, OHIO • PRospect 1-5944

MASTER MAKERS OF
FINE BEARING METALS
SINCE 1860

A. W. Cadman Mfg. Co.

28th and SMALLMAN STS., PITTSBURGH 22, PA.

MODERN ELECTROPLATING

By ALLEN G. GRAY
563 pages • 64 illustrations

A fundamental work drawing on the experience of a group of leading authorities. MODERN ELECTROPLATING provides a complete one-volume summary of current plating practices. The only work to emphasize the practical aspects of the science as well as the basic theory on which the applications rest. It reflects the numerous developments in electro-depositing which have made electroplating indispensable in both utility and decorative arts.

PRICE $9.50 POSTPAID
THE PENTON PUBLISHING CO.
Book Dept. 1213 W. 3rd St.
Cleveland 13, Ohio

how much are your abrasives costing you?

It's easy enough to find out.

Here's all you do:

1. Call an ASG representative.
2. Have him supply you with our simple-to-use Abrasive Cost Record form. There's no charge for these.
3. Keep the necessary records for a representative period of time.
4. Let our ASG engineer analyze your cost records, as well as your equipment, with a view to economy and efficiency.

This easy four-step process will *tell* you how much your abrasives are costing you.

And this Engineering Service might well save you hard dollars.

Why not call us today?

A S G

ABRASIVE SHOT & GRIT COMPANY INC.

SPRINGVILLE (Erie County) NEW YORK
Phone: Lyceum 2-2816 Teletype: Springville 502

manufacturers of BLASTRITE quality abrasives

Ferroalloys

MANGANESE ALLOYS

Spiegeleisen: Carlot, per gross ton, Palmerton, Neville Island, Pa. 21-23% Mn, $105; 19-21% Mn, 1-3% Si, $102.50; 16-19% Mn, $100.50.

Standard Ferromanganese: (Mn 74-76%, C 7% approx) base price per net ton, $245, Johnstown, Duquesne, Sheridan, Neville Island, Pa.; Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; Portland, Oreg. Add or subtract $2 for each 1% or fraction thereof of contained manganese over 76% or under 74%, respectively (Mn 79-81%). Lump $253 per net ton, f.o.b. Anaconda or Great Falls, Mont. Add $2.60 for each 1% above 81%; subtract $2.60 for each 1% below 79%, fractions in proportion to nearest 0.1%.

High-Grade Low-Carbon Ferromanganese: (Mn 85-96%). Carload, lump, bulk, max 0.07% C, 35.1c per lb of contained Mn, carload packed 36.4c, ton lots 37.9c, less ton 39.1c. Delivered. Deduct 1.5c for max 0.15% C grade from above prices, 3c for max 0.03% C. 3.5c for max 0.5% C, and 6.5c for max 75% C—max 7% Si. **Special Grade:** (Mn 90% min, C 0.07% max, P 0.06% max). Add 2.05c to the above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.25-1.5%, Si 1.5% max). Carload, lump, bulk, 25.5c per lb of contained Mn; packed, carload 26.8c, ton lot 28.4c, less ton 29.6c.

Electrolytic Manganese Metal: Min carload, bulk, 33.25c; 2000 lb to min carload, 36c; less ton, 38c; 50 lb cans, add 0.5c per lb. Premium for hydrogen-removed metal, 0.75c per lb. Prices are f.o.b. cars, Knoxville, Tenn., freight allowed to St. Louis or any point east of Mississippi River; or f.o.b. Marietta, O., freight allowed.

Silicomanganese: (Mn 65-68%). Carload, lump, bulk, 1.50% C grade, 18.5-21% Si, 12.8c per lb of alloy. Packed, c.l. 14c ton 14.45c, less ton 15.45c, f.o.b. Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; Portland, Oreg. For 2% C grade, Si 16-18.5%, deduct 0.2c from above prices. For 3% grade, Si 12.5-16%, deduct 0.4c from above prices. Spot, add 0.25c.

TITANIUM ALLOYS

Ferrotitanium, Low-Carbon: (Ti 20-25%, Al 3.5% max, Si 4% max, C 0.10% max). Contract, ton lot, 2" x D, $1.50 per lb of contained Ti; less ton to 300 lb, $1.55. (Ti 38-43%, Al 8% max, Si 4% max, C 0.10% max) Ton lot $1.35, less ton to 300 lb $1.37, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis.

Ferrotitanium, High-Carbon: (Ti 15-18%, C 6-8%). Contract min c.l. $240 per ton, f.o.b. Niagara Falls, N. Y., freight allowed to destinations east of Mississippi River and north of Baltimore and St. Louis. Spot, $245.

Ferrotitanium, Medium-Carbon: (Ti 17-21%, C 2-4%). Contract, c.l. $290 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed. Spot, $295.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: C.l. lump, bulk, 28.75c per lb of contained Cr; c.l. packed 30.30c, ton lot 32.05c, less ton 33.45c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome: Cr 63-66% (Simplex), carload, lump, bulk, C 0.025% max, 36.75c per lb contained Cr; 0.010% max, 37.75c. Ton lot, add 3.5c; less ton, add 5.2c. Delivered.

Cr 67-71%, carload, lump, bulk, 0.025% max, 39.75c; 0.05% max, 39.00c; 0.10% max, 38.50c; 0.20% max, 38.25c; 0.50% max, 38.00c; 1.0% max, 37.75c; 1.5% max, 37.50c; 2.0% max, 37.25c. Ton lot, add 3.4c; less ton lot, add 5.1c. Delivered.

Foundry Ferrochrome, High-Carbon: (Cr 62-66%, C 5-7%, Si 7-10%). C.l., 2" x D, bulk 30.8c per lb of contained Cr. Packed, c.l. 32.4c, ton 34.2c, less ton 35.7c. Delivered. Spot, add 0.25c.

Foundry Ferrosilicon Chrome: (Cr 50-54%, Si 28-32%, C 1.25% max). 8M x D, carload bulk 20.05c per lb of alloy, carload packed, 21.25c, ton lot 22.50c; less ton lot 23.70c. Delivered. Spot, add 0.25c.

Ferrochrome-Silicon: Cr 39-41%, Si 42-45%, C 0.05% max or Cr 33-36%, Si 45-48%, C 0.05% max. Carload, lump, bulk, 3" x down and 2" x down, 28.25c per lb contained Cr, 49.60c per lb contained Si, 0.75" x down 29.40c per lb contained Cr, 14.60c per lb contained Si.

Chromium Metal, Electrolytic: Commercial grade (Cr 99.8% min, metallic basis, Fe 0.2% max). Contract, carlot, packed, 2" x D plate (about ⅛" thick) $1.15 per lb, ton lot $1.17, less ton lot $1.19. Delivered. Spot, add 5c.

VANADIUM ALLOYS

Ferrovanadium: Open-hearth grade (V 50-55%, Si 8% max, C 3% max). Contract, any quantity, $3.20 per lb of contained V. Delivered. Spot, add 10c. **Special Grade:** (V 50-55% or 70-75%, Si 2% max, C 0.5% max) $3.30. **High Speed Grade:** (V 50-55% or 70-75%, Si 1.50% max, C 0.20% max) $3.40.

Grainal: Vanadium Grainal No. 1 $1.05 per lb; No. 79, 50c, freight allowed.

Vanadium Oxide: Contract, less carload lot, packed, $1.38 per lb contained V_2O_5, freight allowed. Spot, add 5c.

SILICON ALLOYS

50% Ferrosilicon: Carload, lump, bulk, 14.6c per lb contained Si. Packed, c.l. 17.1c, ton lot 18.55c, less ton 20.20c, f.o.b. Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; Portland, Oreg. Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max). Add 1.45c to 50% ferrosilicon prices.

65% Ferrosilicon: Carload, lump, bulk, 15.75c per lb contained silicon. Packed, c.l. 17.75c, ton lot 19.55c, less ton 20.9c. Delivered. Spot, add 0.35c.

75% Ferrosilicon: Carload, lump, bulk, 16.9c per lb of contained Si. Packed, c.l. 18.8c, ton lot 20.45c, less ton 21.7c. Delivered. Spot, add 0.3c.

90% Ferrosilicon: Carload, lump, bulk, 20c per lb of contained Si. Packed, c.l. 21.65c, ton lot 23.05c, less ton 24.1c. Delivered. Spot, add 0.25c.

Silicon Metal: (98% min Si, 1.00% max Fe, 0.07% max Ca). C.l. lump, bulk, 21.5c per lb of Si. Packed, c.l. 23.15c, ton lot 24.45c, less ton 25.45c. Add 0.5c for max 0.03% Ca grade. Add 0.5c for 0.50% Fe grade analyzing 98.25% min Si.

Alsifer: (Approx 20% Al, 40% Si, 40% Fe). Contract, basis f.o.b. Niagara Falls, N. Y., lump, carload, bulk, 9.85c per lb of alloy; ton lot, packed, 10.85c.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloy: (Zr 12-15%, Si 39-43%, C 0.20% max). Contract, c.l. lump, bulk, 9.25c per lb of alloy. Packed, c.l. 10.45c, ton lot 11.6c, less ton 12.45c. Delivered. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max). Carload bulk 26.25c per lb of alloy, carload, lump, packed 27.25c, ton lot 28.4c, less ton 29.65c. Freight allowed. Spot, add 0.25c.

BORON ALLOYS

Ferroboron: 100 lb or more packed (B 17.50% min, Si 1.50% max, Al 0.50% max, C 0.50% max). Contract, 100 lb or more 1" D, $1.20 per lb of alloy; less than 100 lb $1.30. Delivered. Spot, add 5c. F.o.b. Washington, Pa., prices, 100 lb and over are as follows: Grade A (10-14% B) 85c per lb; Grade B (14-18% B) $1.20; Grade C (19% min B) $1.50.

Borosil: (3 to 4% B, 40 to 45% Si). Carload, bulk, lump, or 3" x D, $5.25 per lb of contained B. Packed, carload $5.40, ton to c.l. $5.50, less ton $5.60. Delivered.

Carbortam: (B 1 to 2%). Lump, carload $320 per ton, f.o.b. Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

CALCIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18% and Si 53-59%). Carload, lump, bulk 23c per lb of alloy, carload packed 24.25c, ton lot 26.15c, less ton 27.15c. Delivered. Spot, add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.5-3%). Carload, lump, bulk 24c per lb of alloy, carload packed 25.65c, ton lot 27.95c, less ton 29.45c. Delivered. Spot, add 0.25c.

BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx 3¾ lb each and containing 2 lb of Cr). Carload, bulk 19.60c per lb of briquet, in bags 20.70c; 3000 lb to c.l. pallets 20.80c; 2000 lb to c.l. in bags 21.90c; less than 2000 lb in bags 22.80c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx 3 lb and containing 2 lb of Mn). Carload, bulk 14.8c per lb of briquet; c.l., packed, bags 16c; 3000 lb to c.l., pallets 16c; 2000 lb to c.l. bags 17.2c; less ton 18.1c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx 3½ lb and containing 2 lb of Mn and approx ½ lb of Si). C.l. bulk 15.1c per lb of briquet; c.l. packed, bags 16.3c, 3000 lb to c.l., pallets 16.3c; 2000 lb to c.l., bags 17.5c; less ton 18.4c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size—weighing approx 5 lb and containing 2 lb of Si and small sizes, weighing approx 2½ lb and containing 1 lb of Si). Carload, bulk 8c per lb of briquet; packed, bags 9.2c; 3000 lb to c.l., pallets 9.6c; 2000 lb to c.l.; bags 10.8c; less ton 11.7c. Delivered. Spot, add 0.25c.

Molybdic-Oxide Briquets: (Containing 2½ lb of Mo each). $1.49 per lb of Mo contained, f.o.b. Langeloth, Pa.

Titanium Briquets: Ti 98.27%, $1 per lb, f.o.b. Niagara Falls, N. Y.

TUNGSTEN ALLOYS

Ferrotungsten: (70-80%). 5000 lb W or more $2.15 per lb (nominal) of contained W. Delivered.

OTHER FERROALLOYS

Ferrocolumbium: (Cb 50-60%, Si 8% max, C 0.1% max). Ton lots 2" x D, $3.45 per lb. of contained Cb; less ton lots $3.50 (nominal). Delivered.

Ferrotantalum Columbium: (Cb 40% approx, Ta 20% approx, and Cb plus Ta 60% min, C 0.30% max). Ton lots 2" x D, $3.05 per lb of contained Cb plus Ta, delivered; less ton lots $3.10.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5-7%, Fe 20% approx). Carlot bulk 19.25c per lb of alloy, c.l. packed ½ in. x 12 M 20.00c, ton lot 21.15c, less ton 22.40c. Delivered. Spot, add 0.25c.

Graphidox No. 4: (Si 48-52%, Ca 5-7%, Ti 9-11%). C.l. packed, 20c per lb of alloy, ton lot 21.15c; less ton lot 22.4c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

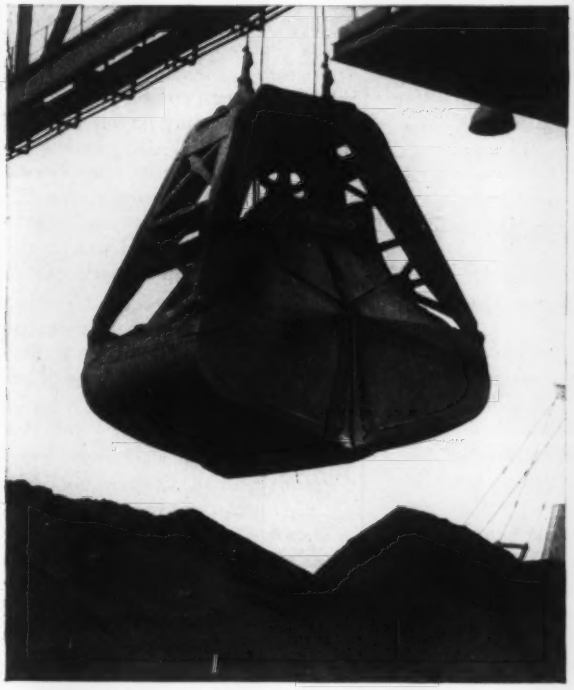
V-3 Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 8-11%). C.l. packed 18.45c per lb of alloy; ton lot 19.95c; less ton lot 21.20c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

Simanal: (Approx 20% each Si, Mn, Al; bal Fe). Lump, carload, bulk 19.25c. Packed c.l. 20.25c, 2000 lb to c.l. 21.25c; less than 2000 lb 21.75c per lb of alloy. Delivered.

Ferrophosphorus: (23-25% based on 24% P content with unitage of $5 for each 1% of P above or below the base). Carload, bulk, f.o.b. sellers' works, Mt. Pleasant, Siglo, Tenn., $120 per gross ton.

Ferromolybdenum: (55-75%). Per lb of contained Mo in 200-lb container, f.o.b. Langeloth and Washington, Pa., $1.76 in all sizes except powdered which is $1.82.

Technical Molybdic-Oxide: Per lb of contained Mo, in cans, $1.47; in bags, $1.46, f.o.b. Langeloth and Washington, Pa.



The Big Bite from Blaw-Knox... 680 cubic feet at one time

Custom-built at Blaw-Knox this huge clamshell bucket lifts enough coal in one bite to heat a seven room house located in a northern climate for a period of two years.

This four-rope, geared hinge, corner bar type clamshell is the largest of more than 400 varieties produced by Blaw-Knox that can be shipped completely assembled. Larger buckets must be delivered in sub-assemblies.

Capacity for any job has become a custom with Blaw-Knox. Every day, buckets designed and built at Blaw-Knox are performing profitably on the "tough" jobs all over the world.

A Blaw-Knox Bucket Engineer will be glad to help you select the bucket best suited to your operation. Contact him today or write for your copy of Blaw-Knox Bulletin number 2292.

BLAW-KNOX COMPANY

Blaw-Knox Equipment Division
Pittsburgh 38, Pennsylvania

BLAW-KNOX

HOT DIP GALVANIZING

JOSEPH P. CATTIE & BROTHERS, INC.
2520 East Hagert Street
Phone: Re-9-8911 **Philadelphia 25, Pa.**

LOOKING FOR SURPLUS MACHINERY?

By checking the classified pages of STEEL each week you'll be able to find many different types of equipment which will fit your requirements. Used or surplus equipment—you can best find it in STEEL's classified columns.

CAN YOU USE A STEEL FABRICATING PLANT IN LOS ANGELES AREA?

Unique opportunity to acquire all or part of this old established company.

Facilities for all code work.

Experienced employees.

Owner can lease, sell, or accept stock.

Brokers Invited.

Write or Wire
BEN SAMPSON
450 E. Colorado, Pasadena, California.

USE THIS NEW KIND OF DIAMOND CUT-OFF WHEEL

Gives narrower, smoother cuts on industry's toughest materials

...yet prices start at only $32.25

Now... at *production prices*... DIATRONIC gives you a rim width of .006" that's accurate to a maximum total tolerance of .0005"—or your money back. This accuracy is built in by a new process. No break-in needed. New narrow cut reduces sawdust loss 30%. A must for $3,000-a-pound silicon or germanium crystal. Cuts tungsten carbide, corundum, aluminum oxide, glass... practically anything. Stock orders shipped in hours; special wheels available. Write for literature, price list.

Another invention marketed by
NAVAN PRODUCTS, INC.
Subsidiary of North American Aviation, Inc.
Dept. 111, International Airport, Los Angeles 45, Cal.

DIATRONIC* DIAMOND WHEELS
"with built-in tolerance" *TRADEMARK

Decline in Scrap Is Slowing Down

STEEL's composite on No. 1 heavy melting steel is still slipping, but it fell only 83 cents in week, against $2.33 the week before. Buying is limited

Scrap Prices, Page 162

Chicago — The market is weak despite record breaking steel production. No. 2 bundles have sold for $23, off $5 from recent sales, and No. 2 heavy melting has been purchased for $32, down $3. It is understood that No. 1 factory bundles, which recently sold for $43, have been refused by the mills at a $41 offering. As a consequence, the entire scrap list is off $1 to $3 a ton.

Philadelphia—Prices dropped last week, with demand slow. Mill stockpiles are large enough to care for needs into the third quarter. No. 1 heavy melting is quoted at $34-$35; No. 2 heavy melting, $28-$29; No. 1 bundles, $37-$38; No. 2 bundles, $22-$23; No. 1 busheling, $35-$36; electric furnace bundles, $39-$40; mixed borings and turnings, $20; heavy turnings, $33-$34; structurals and plates (low phos), $41-$43; couplers, springs, and wheels, $42-$43; rail crops, $58-$60. Prices on the cast iron grades are unchanged.

New York—Brokers have reduced their buying prices on most steel grades $1 a ton. The decline reflects a continued lag in domestic demand and an easier flow of material. Milder weather is stimulating collections and processing.

Pittsburgh — Steelmaking operations are at the highest level in more than two years (97 per cent of capacity), but it's still a scrap buyer's market. A district mill cut its purchase prices on No. 1 heavy melting, No. 1 dealer bundles, and No. 2 bundles several times in the last few weeks without running into much resistance.

Cleveland—The market continues weak in the absence of active mill demand. Although steelmaking operations are at 96.5 per cent of capacity here, and 93 per cent in Youngstown, steelmakers are not showing much interest in scrap. They are depending largely on blast furnace hot metal and home generated scrap to support open hearth operations. A Youngstown area mill purchased No. 1 heavy melting at $40 last week, about in line with the level prevailing the last couple of weeks.

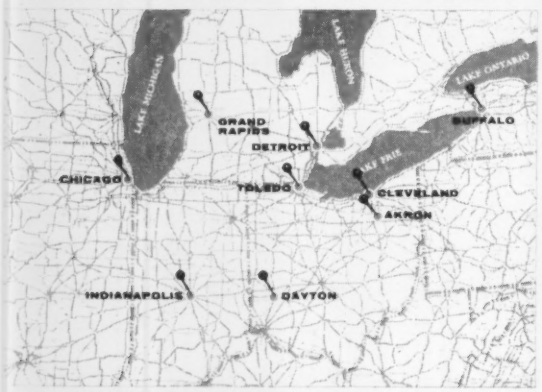
Buffalo—Leading steel grades are down $3 to $5 as result of new purchases. Mills paid $35 for No. 1 heavy melting, $30 for No. 2 heavy melting, and $25 for No. 2 bundles. Blast furnace grades are down about $1, and railroad scrap is off $4 to $5. Cast scrap is unchanged.

Detroit—A little action by Great Lakes Steel and Canadian buyers caused a momentary price flurry here last week. But the over-all feeling is that it won't cause a significant change in the market.

Great Lakes bought between 8000 and 10,000 tons of No. 1 bundles, starting at $33 delivered. The price dropped to $32 as scrap started coming in. There was some buying of No. 2 bundles which caused the

PENINSULAR'S Team of
9 Steel Service Centers
working together to give you
STEEL plus SERVICE

America's Largest Independent Tool Steel Distributor



TOOL STEELS • ALLOYS • COLD DRAWN • HOLLOBAR
FLAT GROUND STOCK • DRILL ROD • PLATE

Over 40 Years of Service to Industry

PENINSULAR STEEL COMPANY
24401 GROESBECK • P. O. BOX 3853 • DETROIT 5, MICHIGAN
DREXEL 1-9400 • PRESCOTT 8-2121
DETROIT • CLEVELAND • INDIANAPOLIS • TOLEDO • AKRON • DAYTON • CHICAGO • GRAND RAPIDS • BUFFALO

Metal Cutting Knives ONLY

We offer forty years of experience in producing the highest quality Metal Cutting Knives and skilled craftsmen working with the finest materials to exacting tolerances.

A bulletin on "Metal Shearing Aids" will be sent on request.

THE HILL ACME COMPANY
CLEVELAND KNIFE DIVISION
1201 West 65th St. • Cleveland 2, Ohio

prices on the No. 2 grades to move up slightly. Turnings are sluggish. So are the cast grades. Little more action is anticipated until month-end auto lists come out.

Cincinnati — Prices dropped another $1 to $4 a ton here last week. No. 1 heavy melting is now quoted by brokers at $34-$35, off $1.50.

St. Louis—The market is tending downward. Prices are off $1 to $2 a ton on the open hearth and railroad categories. Sales are small and supplies are adequate. Only the cast iron grades are moving steadily.

Birmingham—An electric furnace operator returned to the market last week with sizable purchases at prices $1 to $4 under those last paid.

Houston—The market is listless, with major orders covered. Activity is confined to shipments to the Houston mill on a sizable April order. Exports have failed to develop. Surplus stocks are building up in the area.

San Francisco—No. 2 heavy melting steel is off $1 a ton. It's being quoted at $33. The reduction is due to absence of active buying. Other grades are unchanged. The main activity is in exports.

Los Angeles—There's a shortage of scrap in the immediate area. Collections are off, and buying is spirited. Except for a drop of $3 on No. 2 bundles, prices are firm.

Seattle—Japan's re-entry into the west coast scrap market has had a firming effect; domestic prices advanced about $3 a ton in recent weeks. Several full cargoes are booked for loading at Portland, Oreg., within a month.

Jump in Western Steel Shipments Is Predicted

Steelmakers in the 11 western states will increase their shipments this year 19 per cent over 1958's, predicts L. B. Worthington, president, Columbia-Geneva Steel Div., U. S. Steel Corp., San Francisco. He estimates 1959 shipments in the area will reach 6,800,000 tons.

Construction, he figures, will consume about 18 per cent more steel, new projects including pipelines, municipal water systems, a rise in military outlays, and an increase in highway building.

He says the American steel industry's outlook is greatly improved over that a year ago, adding he expects there will be a substantial renewal of plans to modernize and streamline steel operations. The industry, he says, has orders on hand which will allow near capacity operations through June, but beyond that point the question of an industrywide strike clouds prospects.

Structural Shapes . . .

Structural Shape Prices, Page 150

Structurals are in brisk demand because: 1. Construction is picking up seasonally. 2. Railroads are making car repairs and building equipment. 3. Fabricators are stockpiling steel for third quarter jobs.

Shape tonnage can be had on a four to six week cycle, but producers

(*Please turn to Page* 167)

. . . for the right answer to your fastener problems

B

BOLTS AND NUTS

FULL LINE

Cap Screws, Carriage, Machine, Lag, Tap and Plow, Step-Elevator, Stove, High Strength, Anchor, Nylok, SpinLok, Place and Special Bolts

QUALITY IN QUANTITY

From billet to bolt, from our own rolling and wire drawing mills to final inspection — our fasteners are produced by modern equipment to closely controlled standards.

SERVICE

Two modern plants, Three convenient District Sales Offices, Specialized engineering service and an experienced field staff assure satisfaction for any requirement.

Write for brochure... "How To Specify Fasteners and Save"

Phone or write for our quotes on your fastener requirements.

BUFFALO BOLT COMPANY

Division of Buffalo-Eclipse Corporation

Plants: North Tonawanda, New York and Princeton, Illinois

DISTRICT SALES OFFICES

CHICAGO, ILLINOIS
1534-35 Monadnock Bldg.
HArrison 7-2178

NEW YORK CITY
50 Church Street
REctor 2-1888

NORTH TONAWANDA, N.Y.
101 East Avenue
JAckson 2400 (Buffalo)

Company Salesmen in all principal centers

Iron and Steel Scrap

Consumer prices per gross ton, except as otherwise noted, including brokers' commission, as reported to STEEL, April 8, 1959. *Changes shown in italics.*

STEELMAKING SCRAP COMPOSITE

Apr. 8	$36.17
Apr. 1	37.00
Mar. Avg.	40.40
Apr. 1958	33.08
Apr. 1954	25.67

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania.

PITTSBURGH

No. 1 heavy melting	36.00-37.00
No. 2 heavy melting	*32.00-33.00*
No. 1 dealer bundles	39.00-40.00
No. 2 bundles	26.00-27.00
No. 1 busheling	38.00-39.00
No. 1 factory bundles	*45.00-46.00*
Machine shop turnings	22.00-23.00
Mixed borings, turnings	22.00-23.00
Short shovel turnings	25.00-26.00
Cast iron borings	25.00-26.00
Cut structurals:	
2 ft and under	*46.00-47.00*
3 ft lengths	*45.00-46.00*
Heavy turnings	34.00-35.00
Punchings & plate scrap	*47.00-48.00*
Electric furnace bundles	*47.00-48.00*

Cast Iron Grades

No. 1 cupola	45.00-46.00
Stove plate	*45.00-46.00*
Unstripped motor blocks	*32.00-33.00*
Clean auto cast	*46.00-47.00*
Drop broken machinery	51.00-52.00

Railroad Scrap

No. 1 R.R. heavy melt.	39.00-40.00
Rails, 2 ft and under	*57.00-58.00*
Rails, 18 in. and under	*58.00-59.00*
Random rails	*54.00-55.00*
Railroad specialties	*48.00-49.00*
Angles, splice bars	*48.00-49.00*
Rails, rerolling	61.00-62.00

Stainless Steel Scrap

18-8 bundles & solids	225.00-230.00
18-8 turnings	120.00-125.00
430 bundles & solids	125.00-130.00
430 turnings	55.00-65.00

CHICAGO

No. 1 hvy melt., indus.	39.00-40.00
No. 1 hvy melt., dealer	*35.00-36.00*
No. 2 heavy melting	*31.00-32.00*
No. 1 factory bundles	*40.00-41.00*
No. 1 dealer bundles	*35.00-36.00*
No. 2 bundles	*23.00-25.00*
No. 1 busheling, indus.	39.00-40.00
No. 1 busheling, dealer	*35.00-36.00*
Machine shop turnings	*18.00-19.00*
Mixed borings, turnings	*20.00-21.00*
Short shovel turnings	*20.00-21.00*
Cast iron borings	*20.00-21.00*
Cut structurals, 3 ft.	*42.00-43.00*
Punchings & plate scrap	*43.00-44.00*

Cast Iron Grades

No. 1 cupola	*46.00-47.00*
Stove plate	*42.00-43.00*
Unstripped motor blocks	*36.00-37.00*
Clean auto cast	*53.00-54.00*
Drop broken machinery	*53.00-54.00*

Railroad Scrap

No. 1 R.R. heavy melt.	*40.00-41.00*
R.R. malleable	*54.00-55.00*
Rails, 2 ft and under	*53.00-54.00*
Rails, 18 in. and under	*54.00-55.00*
Angles, splice bars	*49.00-50.00*
Axles	*67.00-68.00*
Rails, rerolling	*59.00-60.00*

Stainless Steel Scrap

18-8 bundles & solids	215.00-225.00
18-8 turnings	120.00-125.00
430 bundles & solids	*120.00-125.00*
430 turnings	55.00-60.00

YOUNGSTOWN

No. 1 heavy melting	40.00-41.00
No. 2 heavy melting	28.00-29.00
No. 1 busheling	40.00-41.00
No. 1 bundles	40.00-41.00
No. 2 bundles	25.00-26.00
Machine shop turnings	17.00-18.00
Short shovel turnings	22.00-23.00
Cast iron borings	22.00-23.00
Low phos.	45.00-46.00
Electric furnace bundles	41.00-42.00

Railroad Scrap

No. 1 R.R. heavy melt.	*38.00-39.00*

CLEVELAND

No. 1 heavy melting	36.00-37.00
No. 2 heavy melting	24.00-25.00
No. 1 factory bundles	40.00-41.00
No. 1 bundles	36.00-37.00
No. 2 bundles	24.00-25.00
No. 1 busheling	36.00-37.00
Machine shop turnings	14.00-15.00
Short shovel turnings	20.00-21.00
Mixed borings, turnings	20.00-21.00
Cast iron borings	20.00-21.00
Cut foundry steel	37.00-38.00
Cut structurals, plates 2 ft and under	44.00-45.00
Low phos, punchings & plate	37.00-38.00
Alloy free, short shovel turnings	22.00-23.00
Electric furnace bundles	37.00-38.00

Cast Iron Grades

No. 1 cupola	47.00-48.00
Charging box cast	38.00-39.00
Heavy breakable cast	38.00-39.00
Stove plate	44.00-45.00
Unstripped motor blocks	33.00-34.00
Brake shoes	36.00-37.00
Clean auto cast	47.00-48.00
Burnt cast	37.00-38.00
Drop broken machinery	50.00-51.00

Railroad Scrap

R.R. malleable	65.00-66.00
Rails, 2 ft and under	57.00-58.00
Rails, 18 in. and under	58.00-59.00
Rails, random lengths	52.00-53.00
Cast steel	46.00-47.00
Railroad specialties	48.00-49.00
Uncut tires	42.00-43.00
Angles, splice bars	53.00-54.00
Rails, rerolling	58.00-59.00

Stainless Steel

(Brokers' buying prices; f.o.b. shipping point)

18-8 bundles, solids	215.00-220.00
18-8 turnings	110.00-115.00
430 clips, bundles, solids	115.00-125.00
430 turnings	45.00-55.00

ST. LOUIS

(Brokers' buying prices)

No. 1 heavy melting	35.00
No. 2 heavy melting	33.00
No. 1 bundles	*39.00*
No. 2 bundles	26.00
No. 1 busheling	*37.00*
Machine shop turning	*18.00*
Short shovel turnings	*20.00*

Cast Iron Grades

No. 1 cupola	50.00
Charging box cast	40.00
Heavy breakable cast	38.00
Unstripped motor blocks	41.00
Clean auto cast	50.00
Stove plate	*45.50*

Railroad Scrap

No. 1 R.R. heavy melt.	*40.00*
Rails, 18 in. and under	*52.00*
Rails, random lengths	*46.50*
Rails, rerolling	59.00
Angles, splice bars	*48.00*

BIRMINGHAM

No. 1 heavy melting	32.00-33.00
No. 2 heavy melting	28.00-29.00
No. 1 bundles	33.00-34.00
No. 2 bundles	21.00-22.00
No. 1 busheling	33.00-34.00
Cast iron borings	14.00-15.00
Machine shop turnings	23.00-24.00
Short shovel turnings	24.00-25.00
Bars, crops and plates	*40.00-41.00*
Structurals & plates	*39.00-40.00*
Electric furnace bundles	*36.00-37.00*
Electric furnace:	
2 ft and under	*34.00-35.00*
3 ft and under	*33.00-34.00*

Cast Iron Grades

No. 1 cupola	53.00-54.00
Stove plate	53.00-54.00
Charging box cast	29.00-30.00
Unstripped motor blocks	40.00-41.00
No. 1 wheels	40.00-41.00

Railroad Scrap

No. 1 R.R. heavy melt.	37.00-38.00
Rails, 18 in. and under	49.00-50.00
Rails, rerolling	*51.00-52.00*
Rails, random lengths	*41.00-42.00*
Angles, splice bars	*42.00-43.00*

PHILADELPHIA

No. 1 heavy melting	*34.00-35.00*
No. 2 heavy melting	*28.00-29.00*
No. 1 bundles	*37.00-38.00*
No. 2 bundles	*22.00-23.00*
No. 1 busheling	*35.00-36.00*
Electric furnace bundles	*39.00-40.00*
Mixed borings, turnings	*20.00†*
Short shovel turnings	*23.00-24.00*
Machine shop turnings	*20.00†*
Heavy turnings	*33.00-34.00*
Structurals & plate	*41.00-43.00*
Couplers, springs, wheels	*42.00-43.00*
Rail crops, 2 ft & under	*58.00-60.00*

Cast Iron Grades

No. 1 cupola	41.00
Heavy breakable cast	43.00
Drop broken machinery	49.00-50.00
Malleable	68.00

NEW YORK

(Brokers' buying prices)

No. 1 heavy melting	*27.00-28.00*
No. 2 heavy melting	*24.00-25.00*
No. 1 bundles	*27.00-28.00*
No. 2 bundles	*17.00-18.00*
Machine shop turnings	*10.00-11.00*
Mixed borings, turnings	*13.00-14.00*
Short shovel turnings	*14.00-15.00*
Low phos. (structurals & plates)	35.00-36.00

Cast Iron Grades

No. 1 cupola	36.00-37.00
Unstripped motor blocks	24.00-25.00
Heavy breakable	34.00-35.00

Stainless Steel

18-8 sheets, clips, solids	195.00-200.00
18-8 borings, turnings	85.00-90.00
410 sheets, clips, solids	55.00-60.00
430 sheets, clips, solids	85.00-90.00

BUFFALO

No. 1 heavy melting	*34.00-35.00*
No. 2 heavy melting	*29.00-30.00*
No. 1 bundles	*34.00-35.00*
No. 2 bundles	*24.00-25.00*
No. 1 busheling	*34.00-35.00*
Mixed borings, turnings	*19.00-20.00*
Machine shop turnings	*17.00-18.00*
Short shovel turnings	*21.00-22.00*
Cast iron borings	*19.00-20.00*
Low phos structurals and plate, 2 ft and under	*43.00-44.00*

Cast Iron Grades

(F.o.b. shipping point)

No. 1 cupola	47.00-48.00
No. 1 machinery	51.00-52.00

Railroad Scrap

Rails, random lengths	*45.00-46.00*
Rails, 3 ft and under	*51.00-52.00*
Railroad specialties	*43.00-44.00*

CINCINNATI

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	*34.00-35.00*
No. 2 heavy melting	*27.50-28.50*
No. 1 bundles	*34.00-35.00*
No. 2 bundles	*21.00-22.00*
No. 1 busheling	*34.00-35.00*
Machine shop turnings	*16.00-17.00*
Mixed borings, turnings	*16.00-17.00*
Short shovel turnings	*18.00-19.00*
Cast iron borings	*17.00-18.00*
Low phos., 18 in.	*43.00-44.00*

Cast Iron Grades

No. 1 cupola	*43.00-45.00*
Heavy breakable cast	39.00-40.00
Charging box cast	38.00-39.00
Drop broken machinery	48.00-49.00

Railroad Scrap

No. 1 R.R. heavy melt.	*38.00-39.00*
Rails, 18 in. and under	*54.00-55.00*
Rails, random lengths	*47.00-48.00*

HOUSTON

(Brokers' buying prices; f.o.b. cars)

No. 1 heavy melting	36.00
No. 2 heavy melting	33.00
No. 1 bundles	36.00
No. 2 bundles	23.00†
Machine shop turnings	17.00
Short shovel turnings	20.00
Low phos. plates & structurals	43.00

Cast Iron Grades

No. 1 cupola	43.00
Heavy breakable	27.00-28.00†
Foundry malleable	37.00
Unstripped motor blocks	35.00

Railroad Scrap

No. 1 R.R. heavy melt.	36.00

BOSTON

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	*26.00-27.00*
No. 2 heavy melting	23.00-23.50
No. 1 bundles	*26.00-27.00*
No. 1 busheling	*26.00-27.00*
Machine shop turnings	11.00-11.50
Short shovel turnings	13.00-14.00
No. 1 cast	33.00
Mixed cupola cast	33.00
No. 1 machinery cast	34.00

DETROIT

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	*28.00-29.00*
No. 2 heavy melting	*19.00-20.00*
No. 1 bundles	*30.00-31.00*
No. 2 bundles	*17.00-18.00*
No. 1 busheling	27.00-28.00
Machine shop turnings	13.00-14.00
Mixed borings, turnings	14.00-15.00
Short shovel turnings	15.00-16.00

Cast Iron Grades

No. 1 cupola	40.00-41.00
Stove plate	30.00-31.00
Charging box cast	32.00-33.00
Heavy breakable	32.00-33.00
Unstripped motor blocks	19.00-20.00
Clean auto cast	43.00-44.00

SEATTLE

No. 1 heavy melting	35.00
No. 2 heavy melting	33.00
No. 1 bundles	29.00†
No. 2 bundles	23.00†
Machine shop turnings	*17.00*
Mixed borings, turnings	*17.00*
Electric furnace No. 1	38.00†

Cast Iron Grades

No. 1 cupola	*34.00*
Heavy breakable cast	28.00†
Unstripped motor blocks	*26.00*
Stove plate (f.o.b. plant)	21.00†

LOS ANGELES

No. 1 heavy melting	38.00
No. 2 heavy melting	36.00
No. 1 bundles	35.00
No. 2 bundles	*18.00*
Machine shop turnings	17.00
Shoveling turnings	18.00
Cast iron borings	18.00
Cut structurals and plate 1 ft and under	49.00

Cast Iron Grades

(F.o.b. shipping point)

No. 1 cupola	45.00

Railroad Scrap

No. 1 R.R. heavy melt.	41.00

SAN FRANCISCO

No. 1 heavy melting	36.00
No. 2 heavy melting	*33.00*
No. 1 bundles	34.00
No. 2 bundles	22.00
Machine shop turnings	16.00
Mixed borings, turnings	16.00
Cast iron borings	16.00
Heavy turnings	16.00
Short shovel turnings	16.00
Cut structurals, 3 ft	42.00

Cast Iron Grades

No. 1 cupola	44.00
Charging box cast	34.00
Stove plate	34.00
Heavy breakable cast	28.00
Unstripped motor blocks	31.00
Clean auto cast	40.00
Drop broken machinery	40.00
No. 1 wheels	34.00

HAMILTON, ONT.

(Brokers' buying prices)

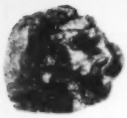
No. 1 heavy melting	34.50
No. 2 heavy melting	30.50
No. 1 bundles	34.50
No. 2 bundles	25.00
Mixed steel scrap	26.50
Mixed borings, turnings	15.00
Busheling, new factory:	
Prepared	34.50
Unprepared	28.50
Short steel turnings	19.00

Cast Iron Grades‡

No. 1 machinery cast	45.00

†Nominal.

‡F.o.b. Hamilton, Ont.



. . . need Vancoram Low Carbon Ferrotitanium! In petroleum refineries, in chemical plants or wherever elevated temperatures and corrosive conditions are encountered, stainless and heat resistant steels stabilized with titanium are the answer to many troublesome problems. Most stainless producers know that the only sure means of titanium addition is through time-tested VANCORAM FERROTITANIUM ALLOYS. From the various types available, select the one best suited to your melting practice and end-use applications.

30% TITANIUM GRADE—For applications where intermediate titanium content is desired.
40% TITANIUM GRADE—For applications where smaller additions are desired.
27/32% TITANIUM SPECIAL GRADES—For large additions where very low aluminum content is required. (A series of alloys of various aluminum contents).

Write us for additional information on these quality Vancoram Alloys. Vanadium Corporation of America, 420 Lexington Avenue, New York 17, N. Y. • Chicago • Cleveland • Detroit • Pittsburgh

Producers of alloys, metals and chemicals

VANCORAM

VANADIUM CORPORATION OF AMERICA

Silver Price Won't Go Up

Geared to the selling price of the U. S. Treasury, the present quotation has hit a ceiling. Copper prices look stable until after midyear. Lead, zinc seen stable

Nonferrous Metal Prices, Pages 166 & 167

HAVE YOU BEEN wondering why the price of silver hasn't changed in the last few weeks?

As the year opened, the Handy & Harman price was 89.875 cents per troy ounce. After seven moves, the present quotation of 91.375 cents an ounce was reached on Mar. 4.

• **No Higher** — In effect, we've reached a price ceiling. Here's why: For some time, the U. S. Treasury Department has sold silver to domestic buyers from its free stocks for 91 cents a troy ounce f.o.b. San Francisco mint. When demand exceeded what metal dealers could supply, the New York published price was increased to 91.375 cents.

The difference between the f.o.b. San Francisco price and the New York published price represents delivery costs to the New York market. (It costs considerably more for users to move small quantities east by truck.) The published price is usually 0.25 cent under the price at which offers are made to Handy & Harman by regular suppliers.

If you're a silver fabricator, you'll probably pay a little more than the base quotations. Most industrial users take an alloy rather than pure silver. Pricing is generally by contract and depends on the alloy and quantity.

• **Market Strong**—Sales are running at a rapid pace. One supplier estimates its sales are 25 to 35 per cent stronger than they were at this time last year. Two reasons: 1. Increased consumption by industrial users. 2. The French government is buying on the U. S. market for its accelerated coinage program.

Copper Price Firm

It's unlikely you'll see a price change on primary copper until after midyear. Metalmen believe movement before then would be triggered by wildcat labor troubles.

Primary demand remains strong. Although consumers still clamor for metal, the market's not quite so hectic. There has evidently been some letup in hedge buying.

Metalmen make one qualification about the market's stability. They candidly admit buyer psychology is so fickle almost anything could start a hysterical clamor for metal.

Demand for custom smelter copper varies from producer to producer. "Pretty fair" is the consensus. The price situation is a little murkier than primary, but the 34 cent a pound quotation should hold over the near future.

No Spurt in Lead, Zinc

The recent 0.5 cent a pound price drop in lead has done little to firm the market. Demand probably has picked up some but any gain has been minor.

Producers don't foresee a substantial sales pickup near. Contrary to the situation in some other metals, there has been virtually no inventory buying.

Don't take any bets on what the lead price will do in the next few weeks. Metalmen say it will either hold or fall another 0.5 cent, with odds weighted in favor of stability.

Zinc demand is spotty. Sales are good to galvanizers and brass mills, only mediocre to diecasters. Like lead, the zinc market doesn't show any signs of a substantial pickup.

There's a strong feeling the price will hold at 11 cents a pound, but don't rule out a drop. The world market still has the jitters, especially in Canada where the price fell 0.5 cent last week.

Italy Steps Up Imports

Italy's fast paced industrial expansion will chew up an estimated 145,000 tons of nonferrous metal imports this year. Breakdown: Copper, 115,000 tons; lead, 10,000 tons; nickel, 6000 tons; aluminum, 5000 tons; zinc, 5000 tons; and tin, 4000 tons.

NONFERROUS PRICE RECORD

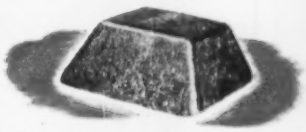
	Price Apr. 8	Last Change	Previous Price	Mar. Avg	Feb. Avg	Apr., 1958 Avg
Aluminum	24.70	Aug. 1, 1958	24.00	24.700	24.700	24.000
Copper	31.50–34.00	Mar. 16, 1959	31.50–32.00	32.031	30.159	24.323
Lead	10.80	Apr. 1, 1959	11.30	11.238	11.368	11.800
Magnesium	35.25	Aug. 13, 1956	33.75	35.250	35.250	35.250
Nickel	74.00	Dec. 6, 1956	64.50	74.000	74.000	74.000
Tin	102.50	Apr. 8, 1959	102.625	103.000	102.364	93.021
Zinc	11.00	Feb. 25, 1959	11.50	11.000	11.409	10.000

Quotations in cents per pound based on: COPPER, mean of primary and secondary, deld. Conn. Valley; LEAD, common grade, deld. St. Louis; ZINC, prime western, E St. Louis; TIN, Straits, deld. New York; NICKEL, electrolytic cathodes, 99.9%, base size at refinery, unpacked; ALUMINUM, primary pig, 99.5+%, f.o.b. shipping point; MAGNESIUM, pig, 99.8%, Velasco, Tex.

"Metallic yield goes up with pig-cast ferrosilicon"

Now steel producers can increase silicon recoveries and simplify handling operations with new ELECTROMET pig-cast 75% ferrosilicon. The pigs provide a convenient, uniform lump size for ferrosilicon additions to steel. They produce a higher, more consistent metallic yield because fines are practically eliminated. Ready solubility is achieved because pig additions penetrate the molten steel very quickly. The uniform shape and weight of the pigs (10 to 15 lbs. or 20 to 25 lbs.) make handling easier in both unloading and furnace operations. Your UNION CARBIDE METALS representative will gladly give you further information.

UNION CARBIDE METALS COMPANY, Division of Union Carbide Corporation, 30 East 42nd Street, New York 17, N. Y.



Pigs are easy to handle and give a high metallic yield.

UNION CARBIDE METALS

Electromet *Brand Ferroalloys and other Metallurgical Products*

The terms "Electromet" and "Union Carbide" are registered trade-marks of Union Carbide Corporation.

Nonferrous Metals

Cents per pound, carlots except as otherwise noted.

PRIMARY METALS AND ALLOYS

Aluminum: 99.5%, pigs 24.70; ingots, 26.80, 30,000 lb or more, f.o.b. shipping point. Freight allowed on 500 lb or more.

Aluminum Alloy: No. 13, 28.60; No. 43, 28.40; No. 195, 29.40; No. 214, 30.20; No. 356, 28.60; 30 or 40 lb ingots.

Antimony: R.M.M. brand, 99.5%, 29.00; Lone Star brand, 29.50, f.o.b. Laredo, Tex., in bulk. Foreign brands, 99.5%, 24.50-25.00, New York, duty paid, 10,000 lb or more.

Beryllium: 97% lump or beads, $71.50 per lb. f.o.b. Cleveland or Reading, Pa.

Beryllium Aluminum: 5% Be, $74.75 per lb of contained Be, with balance as Al at market price, f.o.b. shipping point.

Beryllium Copper: 3.75-4.75% Be, $43 per lb of contained Be, with balance as Cu at market price on shipment date, f.o.b. shipping point.

Bismuth: $2.25 per lb, ton lots.

Cadmium: Sticks and bars, $1.30 per lb deld.

Cobalt: 97.99%, $1.75 per lb for 500-lb keg; $1.77 per lb for 100 lb case; $1.82 per lb under 100 lb.

Columbium: Powder, $55-85 per lb, nom.

Copper: Electrolytic, 31.50 deld.; custom smelters, 34.00; lake, 31.50 deld.; fire refined, 31.25 deld.

Germanium: First reduction, less than 1 kg. 41.00 per gram; 1-10 kg, 37.00 per gram; intrinsic grade, 35.00-37.00 per gram.

Gold: U. S. Treasury, $35 per oz.

Indium: 99.9%, $2.25 per troy oz.

Iridium: $75-80 nom. per troy oz.

Lead: Common, 10.80; chemical, 10.90; corroding, 10.90, St. Louis. New York basis, add 0.20.

Lithium: Cups or ingots, 50-100 lb, $10 per lb, f.o.b. Minneapolis; 100-500 lb, $9.50 per lb deld.

Magnesium: Pig, 35.25; ingot, 36.00 f.o.b. Velasco, Tex.; 12 in. sticks, 59.00 f.o.b. Madison, Ill.

Magnesium Alloys: AZ91A (diecasting), 40.75 deld.; AZ63A, AZ92A, 9Z91C (sand casting), 40.75, f.o.b. Velasco, Tex.

Mercury: Open market, spot, New York, $227-231 per 76 lb flask.

Molybdenum: Unalloyed, turned extrusion, 3.75-5.75 in. round, $9.60 per lb in lots of 2500 lb or more, f.o.b. Detroit.

Nickel: Electrolytic cathodes, sheets (4 x 4 in. and larger), unpacked, 74.00; 10-lb pigs, unpacked, 78.25; "XX" nickel shot, 79.50; "F" nickel shot for addition to cast iron, 74.50; "F" nickel, 5 lb ingots in kegs for addition to cast iron, 75.50. Prices f.o.b. Port Colborne, Ont., including import duty. New York basis, add 1.01. Nickel oxide sinter at Buffalo, New York, or other established U. S. points of entry, contained nickel, 69.60.

Osmium: $70-100 per troy oz nom.

Palladium: $18-20 per troy oz.

Platinum: $77-80 per troy oz from refineries.

Radium: $16-21.50 per mg radium content, depending on quantity.

Rhodium: $122-125 per troy oz.

Ruthenium: $55-60 per troy oz.

Selenium: $7.00 per lb, commercial grade.

Silver: Open market, 91.375 per troy oz.

Sodium: Solid pack, c.l., 19.50; l.c.l., 20.00; brick, c.l., 21.00; l.c.l., 21.50; tank car, 17.00.

Tantalum: Rod, $60 per lb; sheet, $55 per lb.

Tellurium: $1.65-1.85 per lb.

Thallium: $7.50 per lb.

Tin: Straits, N. Y., spot and prompt, 102.50.

Titanium: Sponge, 99.3 + % grade A-1, ductile (0.3% Fe max.), $1.62-1.82; grade A-2 (0.5% Fe max.), $1.70 per lb.

Tungsten: Powder, 98.8%, carbon reduced, 1000-lb lots, $2.75-2.90 per lb nom., f.o.b shipping point; less than 1000 lb, add 15.00; 99 + % hydrogen reduced, $3.30-3.80.

Zinc: Prime Western, 11.00; brass special, 11.25; intermediate, 11.50, East St. Louis, freight allowed over 0.50 per lb. New York basis, add 0.50. High grade, 12.00; special high grade, 12.25 deld. Diecasting alloy ingot No. 3, 13.50; No. 2, 14.00; No. 5, 13.75 deld.

Zirconium: Reactor grade sponge, 100 lb or less, $7 per lb; 100-500 lb, $6.50 per lb; over 500 lb, $6 per lb.

(Note: Chromium, manganese, and silicon metals are listed in ferroalloy section.)

SECONDARY METALS AND ALLOYS

Aluminum Ingot: Piston alloys, 23.875-25.25; No. 12 foundry alloy (No. 2 grade), 21.75-22.00; 5% silicon alloy, 0.60 Cu max., 24.75-25.00; 13 alloy, 0.60 Cu max., 24.75-25.00; 195 alloy, 25.25-26.00; 108 alloy, 22.25-22.50. Steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 23.75; grade 2, 22.50; grade 3, 21.25; grade 4, 19.75.

Brass Ingot: Red brass, No. 115, 32.25; tin bronze, No. 225, 43.25; No. 245, 37.00; high-leaded tin bronze, No. 305, 36.50; No. 1 yellow No. 405, 26.50; manganese bronze, No. 421, 29.75.

Magnesium Alloy Ingot: AZ63A, 37.50; AZ91B, 37.50; AZ91C, 41.25; AZ92A, 37.50.

NONFERROUS PRODUCTS

BERYLLIUM COPPER

(Base prices per lb, plus mill extras, 2000 to 5000 lb; nom. 1.9% Be alloy.) Strip, $1.91, f.o.b. Temple, Pa., or Reading, Pa.; rod, bar, wire, $1.89, f.o.b. Temple, Pa.

COPPER WIRE

Bare, soft, f.o.b. eastern mills, 20,000-lb lots, 36.855; l.c.l., 37.48. Weatherproof, 20,000-lb lots, 37.42; l.c.l., 38.17.

LEAD

(Prices to jobbers, f.o.b. Buffalo, Cleveland, Pittsburgh.) Sheets, full rolls, 140 sq ft or more, $16.50 per cwt; pipe, full coils, $16.50 per cwt; traps and bends, list prices plus 30%.

TITANIUM

(Prices per lb, 10,000 lb and over, f.o.b. mill.) Sheet and strip, $7.50-17.00; sheared mill plate, $5.25-10.00; wire, $5.75-10.00; forging billets, $3.55-5.75; hot-rolled and forged bars, $4.25-7.50.

ZINC

(Prices per lb, c.l., f.o.b. mill.) Sheets, 26.00; ribbon zinc in coils, 21.50; plates, 20.00.

ZIRCONIUM

Plate, $12.50-19.20; H.R. strip, $12.50-22.90; C.R. strip, $15.90-31.25; forged or H.R. bars, $11.00-17.40.

NICKEL, MONEL, INCONEL

	"A" Nickel	Monel	Inconel
Sheets, C.R.	126	106	128
Strip, C.R.	124	108	138
Plate, H.R.	120	105	121
Rod, Shapes, H.R.	107	89	109
Seamless Tubes	157	129	200

ALUMINUM

Sheets: 1100, 3003 and 5005 mill finish (30,000 lb base; freight allowed).

Thickness Range Inches	Flat Sheet	Coiled Sheet
0.250-0.136	42.80-47.30	....
0.136-0.096	43.20-48.30	....
0.126-0.103	....	39.20-39.80
0.096-0.077	43.80-50.00	39.30-40.00
0.077-0.068	44.30-52.20	....
0.077-0.061	....	39.50-40.70
0.068-0.061	44.30-52.20	....
0.061-0.048	44.90-54.40	40.10-41.80
0.048-0.038	45.40-57.10	40.60-43.20
0.038-0.030	45.70-62.00	41.00-45.70
0.030-0.024	46.20-53.70	41.30-45.70
0.024-0.019	46.90-56.80	42.40-44.10
0.019-0.017	47.70-54.10	43.00-44.70
0.017-0.015	48.60-55.00	43.80-45.50
0.015-0.014	49.60	44.80-46.50
0.014-0.012	50.80	45.50
0.012-0.011	51.00	46.70
0.011-0.0095	53.50	48.10
0.0095-0.0085	54.60	49.60
0.0085-0.0075	56.20	50.80
0.0075-0.007	57.70	52.30
0.007-0.006	59.30	53.70

ALUMINUM (continued)

Plates and Circle: Thickness 0.250-3 in. 24-60 in. width or diam., 72-240 in. lengths.

Alloy	Plate Base	Circle Base
1100-F, 3003-F	42.40	47.20
5050-F	43.50	48.30
3004-F	44.50	50.20
5052-F	45.10	50.90
6061-T6	45.60	51.70
2024-T4	49.30	56.10
7075-T6*	57.60	64.70

*24-48 in. width or diam., 72-180 in. lengths

Screw Machine Stock: 30,000 lb base.

Diam. (in.) or across flats*	Round 2011-T3	Round 2017-T4	Hexagonal 2011-T3	Hexagonal 2017-T4
0.125	76.90	73.90	....	....
0.250	62.00	60.20	89.10	76.60
0.375	61.20	60.00	73.50	68.50
0.500	61.20	60.00	73.50	68.50
0.625	61.20	60.00	69.80	64.20
0.750	59.70	58.40	63.60	60.40
0.875	59.70	58.40	63.60	60.40
1.000	59.70	58.40	63.60	60.40
1.125	57.30	56.10	61.50	58.30
1.250	57.30	56.10	61.50	58.30
1.350	57.30	56.10	61.50	58.30
1.500	57.30	56.10	61.50	58.30
1.625	55.00	53.60	....	56.20
1.750	55.00	53.60	60.30	56.20
1.875	55.00	53.60	....	56.20
2.000	55.00	53.60	60.30	56.20
2.125	53.50	52.10	....	....
2.250	53.50	52.10	....	56.20
2.375	53.50	52.10	....	....
2.500	53.50	52.10	....	56.20
2.625	....	50.40	....	....
2.750	51.90	50.40	....	56.20
2.875	....	50.40	....	....
3.000	51.90	50.40	....	56.20
3.125	....	50.40	....	....
3.250	....	50.40	....	....
3.375	....	50.40	....	....

*Selected sizes.

Forging Stock: Round, Class 1, random lengths, diam, 0.375-8 in., "F" temper; 2014, 42.20-55.00; 6061, 41.60-55.00; 7075, 61.60-75.00; 7070, 66.60-80.00.

Pipe: ASA schedule 40, alloy 6063-T6 standard length, plain ends, 90,000 lb base, dollars per 100 ft. Nominal pipe sizes: ¾ in., 18.85; 1 in., 29.75; 1¼ in., 40.30; 1½ in., 48.15; 2 in., 58.30; 4 in., 160.20; 6 in., 287.55; 8 in., 432.70.

Extruded Solid Shapes:

Factor	Alloy 6063-T5	Alloy 6062-T6
9-11	42.70-44.20	51.30-55.50
12-14	42.70-44.20	52.00-56.50
15-17	42.70-44.20	53.20-58.20
18-20	43.20-44.70	55.20-60.80

MAGNESIUM

Sheet and Plate: AZ31B standard grade, 0.32 in., 103.10; .081 in., 77.90; .125 in., 70.40; .188 in., 69.00; .250-2.0 in., 67.90. AZ31B spec. grades, .032 in., 171.30; .081 in., 108.80; .125 in., 98.10; .188 in., 95.70; .250-2.00 in., 93.30. Tread plate, 60-192 in. lengths, 24-72 in. widths; .125 in., 74.90; .188 in., 71.70-72.10; .25-.75 in., 70.60-71.60. Tooling plate, .25-30 in., 73.00.

Extruded Solid Shapes:

Factor	Com. Grade (AZ31C)	Spec. Grade (AZ31B)
6-8	69.60-72.40	84.60-87.40
12-14	70.70-73.00	85.70-88.00
24-26	75.60-76.30	90.60-91.30
36-38	89.20-90.30	104.20-105.30

NONFERROUS SCRAP

DEALERS' BUYING PRICES

(Cents per pound, New York in ton lots.)

Copper and Brass: No. 1 heavy copper and wire, 26.00-26.50; No. 2 heavy copper and wire, 23.75-24.25; light copper, 21.75-22.25; No. 1 composition red brass, 20.50-21.00; No. 1 com-

BRASS MILL PRICES

	MILL PRODUCTS a				SCRAP ALLOWANCES e (Based on copper at 31.50c)		
	Sheet, Strip, Plate	Rod	Wire	Seamless Tubes	Clean Heavy	Rod Ends	Clean Turnings
Copper	55.63b	52.86c	....	55.82	27.500	27.500	26.750
Yellow Brass	48.24	32.73d	48.78	51.65	20.625	19.750	18.750
Low Brass, 80%	51.23	51.17	51.77	54.54	23.250	23.000	22.500
Red Brass, 85%	52.29	52.23	52.83	55.60	24.250	24.000	23.500
Com. Bronze, 90%	53.90	53.84	54.44	56.96	25.125	24.875	24.375
Manganese Bronze	56.54	50.14	60.62	....	19.125	18.875	18.375
Muntz Metal	50.85	46.16	....	....	19.375	19.125	18.625
Naval Brass	52.80	46.61	59.36	56.21	19.125	18.875	18.375
Silicon Bronze	60.67	59.86	60.21	78.35	27.000	26.750	26.000
Nickel Silver, 10%	63.82	66.15	66.15	....	25.500	25.250	12.625
Phos. Bronze	75.34	75.84	75.84	77.02	28.625	28.375	25.750

a. Cents per lb, f.o.b. mill; freight allowed on 500 lb or more. b. Hot-rolled. c. Cold-drawn. d. Free cutting. e. Prices in cents per lb for less than 20,000 lb, f.o.b. shipping point. On lots over 20,000 lb at one time, of any or all kinds of scrap, add 1 cent per lb.

position turnings, 19.50-20.00; new brass clippings, 17.75-18.25; light brass, 13.50-13.75; heavy yellow brass, 14.50-14.75; new brass rod ends, 15.25-15.75; auto radiators, unsweated, 16.00-16.50; cocks and faucets, 16.50-17.00; brass pipe, 16.50-17.00.

Lead: Soft scrap lead, 7.25-7.75; battery plates, 3.25-3.50; linotype and stereotype, 8.75-9.25; electrotype, 7.25-7.75; mixed babbitt, 8.75-9.25.

Monel: Clippings, 26.00-28.00; old sheets, 23.00-25.00; turnings, 20.00-21.00; rods, 26.00-28.00.

Nickel: Sheets and clips, 52.00-54.00; rolled anodes, 52.00-54.00; turnings, 38.00-40.00; rod ends, 52.00-54.00.

Zinc: Old zinc, 3.00-3.25; new diecast scrap, 3.00-3.25; old diecast scrap, 1.50-1.75.

Aluminum: Old castings and sheets, 10.00-10.50; clean borings and turnings, 6.50-7.00; segregated low copper clips, 13.25-13.75; segregated high copper clips, 13.25-13.75; mixed low copper clips, 12.25-12.75; mixed high copper clips, 11.25-11.75.

(Cents per pound, Chicago)

Aluminum: Old castings and sheets, 11.75-12.25; clean borings and turnings, 9.50-10.00; segregated low copper clips, 16.75-17.25; segregated high copper clips, 15.75-16.25; mixed low copper clips, 16.00-16.50; mixed high copper clips, 15.25-15.75.

(Cents per pound, Cleveland)

Aluminum: Old castings and sheets, 10.50-11.00; clean borings and turnings, 9.50-10.00; segregated low copper clips, 14.50-15.00; segregated high copper clips, 13.00-13.50; mixed low copper clips, 13.50-14.00; mixed high copper clips, 12.50-13.00.

REFINERS' BUYING PRICES
(Cents per pound, carlots, delivered refinery)

Beryllium Copper: Heavy scrap, 0.020-in. and heavier, not less than 1.5% Be, 57.50; light scrap, 52.50; turnings and borings, 37.50.

Copper and Brass: No. 1 heavy copper and wire, 29.00; No. 2 heavy copper and wire, 27.50; light copper, 25.25; refinery brass (60% copper) per dry copper content, 27.75.

INGOTMAKERS' BUYING PRICES
Copper and Brass: No. 1 heavy copper and wire, 29.00; No. 2 heavy copper and wire, 27.50; light copper, 25.25; No. 1 composition borings, 22.50; No. 1 composition solids, 23.00; heavy yellow brass solids, 17.00; yellow brass turnings, 16.00; radiators, 18.00.

PLATING MATERIALS

(F.o.b. shipping point, freight allowed on quantities)

ANODES

Cadmium: Special or patented shapes, $1.30.

Copper: Flat-rolled, 47.79; oval, 46.00, 5000-10,000 lb; electrodeposited, 42.50, 2000-5000 lb lots; cast, 45.00, 5000-10,000 lb quantities.

Nickel: Depolarized, less than 100 lb, 114.25; 100-499 lb, 112.00; 500-4999 lb, 107.50; 5000-29,999 lb, 105.25; 30,000 lb, 103.00. Carbonized, deduct 3 cents a lb.

Tin: Bar or slab, less than 200 lb, 121.50; 200-499 lb, 120.00; 500-999 lb, 119.50; 1000 lb or more, 119.00.

Zinc: Balls, 18.00; flat tops, 18.00; flats, 20.75; ovals, 20.00, ton lots.

CHEMICALS

Cadmium Oxide: $1.45 per lb in 100-lb drums.

Chromic Acid (flake): 100-2000 lb, 31.00; 2000-10,000 lb, 30.50; 10,000-20,000 lb, 30.00; 20,000 lb or more, 29.50.

Copper Cyanide: 100-200 lb, 65.90; 300-900 lb, 63.00; 1000-19,900 lb, 61.90.

Copper Sulphate: 100-1900 lb, 15.30; 2000-5900 lb, 13.30; 6000-11,900 lb, 13.05; 12,000-22,900 lb, 12.80; 23,000 lb or more, 12.30.

Nickel Chloride: 100 lb, 45.00; 200 lb, 43.00; 300 lb, 42.00; 400-4900 lb, 40.00; 5000-9900 lb, 38.00; 10,000 lb or more, 37.00.

Nickel Sulphate: 5000-22,999 lb, 29.00; 23,000-39,990 lb, 28.50; 40,000 lb or more, 28.00.

Sodium Cyanide (Cyanobrik): 200 lb, 20.80; 400-800 lb, 19.80; 1000-19,800 lb, 18.80; 20,000 lb or more, 17.80.

Sodium Stannate: Less than 100 lb, 80.10; 100-600 lb, 70.70; 700-1900 lb, 68.00; 2000-9900 lb, 66.10; 10,000 lb or more, 64.80.

Stannous Chloride (Anhydrous): 25 lb, 155.60; 100 lb, 150.70; 400 lb, 148.30; 800-19,900 lb, 107.40; 20,000 lb or more, 101.30.

Stannous Sulphate: Less than 50 lb, 140.70; 50 lb, 110.70; 100-1900 lb, 108.70; 2000 lb or more, 106.70.

Zinc Cyanide: 100-200 lb, 59.00; 300-900 lb, 57.00.

(*Concluded from Page* 161)

expect to go to six-eight weeks within the next 14 days.

While the steel strike threat is not stimulating demand as much as it was, it is still a major factor in speeding up orders for small work (jobs that require relatively little tonnage and can be fitted into fabricating shop schedules without much difficulty). Fabricators are not running full, but they're making sure they'll have steel on hand to keep jobs under contract moving.

More prestressed concrete bridges are coming out at the expense of structural steel.

Prices for stringer, composite rolled beam, and wide flange bridges suffer from intense competition in New England. Contractors, bidding 13 to 15 cents per pound delivered to the job, are shopping among fabricators for quotations of around 11 cents.

R. C. Mahon Co., Detroit, has acquired three California affiliated companies—Mitchell Steel Inc., Walter G. Mitchell Industries, and Mitchell Properties Inc., Torrance. The three will be merged with Mahon in a $3.5 million plant to be built on a 30 acre site in Torrance.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

2500 tons, radio telescope, near Sugar Grove, W. Va., U. S. Naval Research Laboratory, to American Bridge Div., U. S. Steel Corp., Pittsburgh; joint contractors: Tidewater Construction Co., Norfolk, Va., Peter Kiewit Sons Co., Omaha, Nebr., and Patterson-Emerson & Comstock, Pittsburgh; installation will require 20,000 tons, mostly high tensile, to be fabricated at Ambridge, Pa., and Gary, Ind.

1320 tons, six state highway bridges, East Granby-Windsor-Windsor Locks, Conn., to City Iron Works, Wethersfield, Conn.; White Oak Excavators Inc., Plainville, Conn., general contractor.

650 tons, three 4-span beam bridges, Northeastern Highway, near Baltimore, to Atlas Machine & Iron Works Inc.; C. J. Langenfelder & Sons, Baltimore, general contractor.

300 tons, shop buildings, Langley AFB, Virginia, to Structural Steel Co. Inc., Roanoke, Va., including joists, U. S. Engineer, Norfolk, Va.

250 tons, Diamond Center Building, Sixth Avenue and 47th Street, New York, to Bethlehem Fabricators, Bethlehem, Pa.

280 tons, dormitory, University of Massachusetts, Amherst, Mass., to Haarmann Steel Co., Holyoke, Mass.; Aquadro & Cerruti, Northampton, Mass., is general contractor.

206 tons, also 35 tons of reinforcing, Washington State highway bridge, Lewis County, to Poole, McGonigle & Dick, Portland, Oreg.;

CLASSIFIED ADVERTISING

HELP WANTED

Superintendent to take direct charge of all production equipment in cold roll strip steel mill. Excellent salary. References should include all possible previous job superiors.

Apply to: H. B. Hinman, Jr.
ROME STRIP STEEL CO., INC.
530 Henry Street **Rome, N. Y.**

Help Wanted

ROD & STRIP ROLLING MILL SUPT. for nonferrous & stainless wire manufacturer in Newark, N. J. area. Practical experience in hot rolling mill desirable. Full responsibility for all related operations. Send complete record to Box 751, STEEL, Penton Bldg., Cleveland 13, Ohio.

METALLURGICAL ENGINEER

Experience required in the manufacture and application of carbon and alloy steel plate—Philadelphia area location. Reply Box 752, STEEL, Penton Bldg., Cleveland 13, Ohio.

EXPERIENCED SHEET PRODUCTION SUPERINTENDENT. Immediate opening for superintendent with background in aluminum strip and sheet rolling. Prefer Mechanical Engineering Degree, or equivalent, with 3-4 years experience. Must have working knowledge of plant layout and auxiliary equipment. Modern installation in growing Mid-southern community. Independent aluminum production. In resume give age, family, references, experience and salary requirement. Enclose photograph. Reply Box 753, STEEL, Penton Bldg., Cleveland 13, Ohio.

Positions Wanted

STARTING A NEW ALUMINUM REROLL PLANT? I have the experience and the know-how to get your mills rolling. Will furnish complete resume to interested parties. Reply Box 749, STEEL, Penton Bldg., Cleveland 13, Ohio.

WANT TO BUY

Steel By-Products Discs

2"	to 2½"	Dia.	.060 to .125
4½"		Dia.	.060 to .125
6½"	to 10"	Dia.	.060 to .125
11"	to 12½"	Dia.	.085 to .095

Hot or Cold Rolled

KEYSTONE LAMP MFG. CORP.
Purchasing Department
Tel. Slatington, Pa. PO 7-3821

BERRY BEARING COMPANY
Bearing Headquarters Since 1920
Phone: DAnube 6-6800
2633 S. Michigan Ave. • Chicago 16, Ill.

WORKS MANAGER

Outstanding opportunity for man with strong metallurgical background. Production is divided between induction melting of alloys for remelt and vacuum melting primarily for wrought products. Man selected must be able to furnish a high degree of metallurgical control as well as good material and manufacturing controls. He will report directly to the President. Location is in the Midwest. The salary is attractive. Preferred age—35 to 45. Send complete details, in confidence, and include recent photograph.

Reply Box 750, STEEL
Penton Bldg. Cleveland 13, Ohio

52100 · PETERSON · 52100
PETERSON · 52100 · PETER
00 · PETERSON · 52100 · PE
ERSON · 52100 · PETERSON
52100 · PETERSON · 52100
PETERSON · 52100 · PETER
00 · PETERSON · 52100 · PE
ERSON · 52100 · PETERSON
52100 · PETERSON · 52100
PETERSON · 52100 · PETER
00 · PETERSON · 52100 · PE
ERSON · 52100 · PETERSON
52100 · PETERSON · 52100
PETERSON · 52100 · PETER
00 · PETERSON · 52100 · PE
ERSON · 52100 · PETERSON
52100 · PETERSON · 52100
PETERSON · 52100 · PETER
00 · PETERSON · 52100 · PE
ERSON · 52100 · PETERSON

Looking for the world's most complete stock of 52100 steel tubes and bars? You've come to the right spot . . . . . .

PETERSON STEELS, INC.
Union, New Jersey
Detroit, Michigan Chicago, Illinois

Pakar Construction Co., Chehalis, Wash., general contractor.

195 tons, angles, General Stores Supply Office, Navy, Philadelphia, to Southern Galvanizing Co., Baltimore.

175 tons, T-section, grade M, General Stores Supply Office, Navy, Philadelphia, to Jones & Laughlin Steel Corp., Pittsburgh.

STRUCTURAL STEEL PENDING

4800 tons, reconstruction and enlargement, office building, Guaranty Trust Co. of New York, 44th Street and 5th Avenue. (Plans are to add 12 stories.)

4000 tons, viaduct, Erie County, New York; A. E. Ottaviano Inc., Croton-on-Hudson, N. Y., low on general contract.

865 tons, one 6-span, two 5-span, one 4-span, and one 1-span composite wide flange beam bridges, Waterbury, Vt., contracts 1 and 2 (1-89-2); bids Apr. 17, Montpelier, Vt.; also, 175 tons of steel piling.

800 tons, state highwaywork, Suffolk County, New York; Hendrickson Bros. Inc., Valley Stream, N. Y., low on the general contract.

645 tons, transmission towers, Missouri Basin project, North Dakota; bids May 7 to the U. S. Bureau of Reclamation, Denver.

400 tons, state bridgework, Clearview Expressway, Queens, New York; Slattery Construction Co. and Slattery Tunnel Corp., Maspeth, N. Y., low on general contract.

135 tons, including tank, liquid oxygen facilities, AFB, Cheyenne, Wyo.; bids Apr. 21, U. S. Engineer, Omaha, Nebr.

130 tons, wide flange beam, U. S. Engineer, Chicago, delivery to Kewaunee, Wis.

100 tons or more, $2 million state office building, Boise, Idaho; bids to be invited soon, award to be in May.

100 tons or more, prefabricated structure for fuel control test area; bids to Boeing Airplane Co., Seattle, Mar. 31.

REINFORCING BARS . . .

REINFORCING BARS PLACED

1370 tons, Tolt River dam and reservoir, Seattle, to Bethlehem Pacific Coast Steel Corp., Seattle; Anderson Construction Co. Inc., and Willar Construction Co., Seattle, joint general contractors.

920 tons, substructure, Red River bridge, Alexandria, La., to Southern Steel Products Co., New Orleans; Blount Bros. Construction Co., Montgomery, Ala., general contractor.

540 tons, six state highway structures, East Granby-Windsor-Windsor Locks, Conn., to City Iron Works, Wethersfield, Conn.; White Oak Excavators Inc., Plainville, Conn., general contractor.

400 tons, medical research building, Boston University, Boston, to Northern Steel Inc., Boston; Vappi & Co., Cambridge, Mass., general contractor.

300 tons, three 4-span beam bridges, Northeastern Highway, near Baltimore, to Dow-Weld Co., Baltimore; C. J. Langenfelder & Sons, Baltimore, general contractor.

230 tons, General Stores Supply Office, Navy, Philadelphia, to Rochester Iron & Metal Co., Rochester, N. Y.

124 tons, dormitory, University of Massachusetts, Amherst, Mass., to Bethlehem Steel Co., Bethlehem, Pa.; Aquadro & Cerruti, Northampton, Mass., general contractor.

PLATES . . .

PLATES PLACED

1295 tons, Naval shipyard, Portsmouth, N. H., to U. S. Steel Corp., Pittsburgh.

1200 tons, naval shipyard, Portsmouth, N.H., to Lukens Steel Co., Coatesville, Pa.; two contracts.

710 tons, carbon hull plates, General Stores Supply Office, Navy, Philadelphia, to C. Itoh & Co. (America), New York.

250 tons, sheet piling, drydock No. 6, Puget Sound Navy Yard; additional contract to Bethlehem Pacific Coast Steel Corp., Seattle.

195 tons, carbon floor plates, General Stores Supply Office, Navy, Philadelphia, to Phoenix Steel Corp., Harrisburg, Pa.

150 tons, grade Hy-80, naval shipyard, Portsmouth, N.H., to U. S. Steel Corp., Pittsburgh.

Advertising Index

Abrasive Shot & Grit Co., Inc. 157
Acimet Mfg. Co. 157
Allegheny Ludlum Steel Corporation 79
Allied Chemical Corporation, General Chemical Division 81
Allied Research Products, Inc. 144
American Brass Co., The 133
American Schiess Corporation 117
American Waldrich Mfg. Corporation 116
Apex Machine & Tool Co., The 23
Armco Steel Corporation 48

Baldwin-Lima-Hamilton Corporation, Standard Steel Works Division 145
Baltimore & Ohio Railroad 123
Bardons & Oliver, Inc. 21
Basic, Inc. 42
Behr-Manning Co., A Division of Norton Co. 29
Berry Bearing Co. 167
Bethlehem Steel Co. 1
Blaw-Knox Co., Blaw-Knox Equipment Division 159
Bliss, E. W., Co. 9
Borg-Warner Corporation, Ingersoll-Kalamazoo Division 74
Borg-Warner Industrial Cranes 32
Buffalo Bolt Co., Division of Buffalo-Eclipse Corporation 161
Bullard Co., The 68

Cadman, A. W., Mfg. Co. 157
Carlson, G. O., Inc. 33
Carpenter Steel Co., The 35
Cattie, Joseph P., & Brothers, Inc. 159
Chambersburg Engineering Co. 146
Cincinnati Shaper Co., The 30
Clark Controller Co., The 3
Cleveland Punch & Shear Works Co., The .. 120
Cleveland Tramrail Division, The Cleveland Crane & Engineering Co. 87
Colorado Fuel & Iron Corporation, The 66, 67, 137
Continental-Diamond Fibre Corporation 13
Copperweld Steel Co., Ohio Seamless Tube Division 82
Cullen-Friestedt Co. 136
Cutler-Hammer, Inc. ..... Back Cover

Danly Machine Specialties, Inc. 34
Diamond Manufacturing Co. 136
DoAll Co., The 124

Electric Controller & Mfg. Co., The, A Division of The Square D Co. .... Inside Front Cover
Ex-Cell-O Corporation 6
Ex-Cell-O Corporation, Machinery Division .. 7

Fafnir Bearing Co., The 104
Federal Machine & Welder Co., The 130
Fellows Gear Shaper Co., The 17
Fischer Special Mfg. Co. 118
Foote Bros. Gear & Machine Corporation .. 36
Fuller Co. 138

General Chemical Division, Allied Chemical Corporation 81
General Electric Co. 18, 19
General Motors Corporation, Saginaw Steering Gear Division 38
General Steel Castings 31
Greenlee Bros. & Co. 72

Harper, H. M., Co., The 88, 89
Harrington & King Perforating Co., Inc., The 90
Hayes, C. I., Inc. 75
Hill Acme Co., The, Cleveland Knife Division 160
Hyde Park Foundry & Machine Co. 169

Ingersoll Kalamazoo Division, Borg-Warner Corporation 74
Ingersoll-Rand 140
Inland Steel Co. 47

Jeffrey Manufacturing Co., The 41
Jones & Laughlin Steel Corporation, Stainless & Strip Division 39

Kaiser Aluminum & Chemical Sales, Inc., Kaiser Chemicals Division 92, 93
Kearney & Trecker Corporation, Standard Machine Division 84, 85
Keystone Lamp Mfg. Corporation 167

Leeds & Northrup Co. 28
Lodge & Shipley Co., The 113

Magor Car Corporation 143
Marchant, Geo. F., Co. 90
Micromatic Hone Corporation 134, 135
Morgan Construction Co. 63

National Acme Co., The 126, 127
National Steel Corporation 11
Navan Products, Inc. 159
Nilson, A. H., Machine Co., The 94
Norton Co. 40
Norton Co., Behr-Manning Co. Division 29

Ohio Seamless Tube Division of Copperweld Steel Co. 82

Pangborn Corporation ..... Inside Back Cover
Peninsular Steel Co. 160
Peterson Steels, Inc. 168
Pines Engineering Co., Inc. 91
Pittsburgh Engineering & Machine Division of Pittsburgh Steel Foundry Corporation 115
Porter, H. K., Company, Inc., Refractories Division 64

Republic Steel Corporation 14, 15
Robbins & Myers, Inc., Hoist & Crane Division 170
Roebling's, John A., Sons Corporation, A Subsidiary of The Colorado Fuel & Iron Corporation 137
Rogers Brothers Corporation 142
Rome Strip Steel Co., Inc. 167
Royal McBee Corporation, Data Processing Division 103
Ryerson, Joseph T., & Son, Inc. 50

Saginaw Steering Gear Division, General Motors Corporation 38
Sampson, Ben 159
Sandvik Steel, Inc. 20
Scovill Manufacturing Co., Mill Products Division 25, 26
Sintercast Corporation of America 86
SKF Industries, Inc. 2
Square D Co., The, The Electric Controller & Mfg. Co. Division ..... Inside Front Cover
Standard Screw Co. 27
Standard Steel Works Division, Baldwin-Lima-Hamilton Corporation 145
Strom Steel Ball Co. 10
Sun Shipbuilding & Dry Dock Co. 37

Texas Co., The 8
Textile Machine Works, Contract Division .. 24
Tinnerman Products, Inc. 76

Ulbrich Stainless Steels 147
Union Carbide Corporation, Union Carbide Metals Division 165
Union Carbide Metals Co., Division of Union Carbide Corporation 165

Vanadium Corporation of America 163
Veeder-Root, Inc. 4

Wales Strippit, Inc. 12
Ward Steel Co. 16
Washburn Wire Co. 22
Wean Equipment Corporation 71
Weirton Steel Co. 11
Wheeling Steel Corporation 119
Wheland Co., The 16

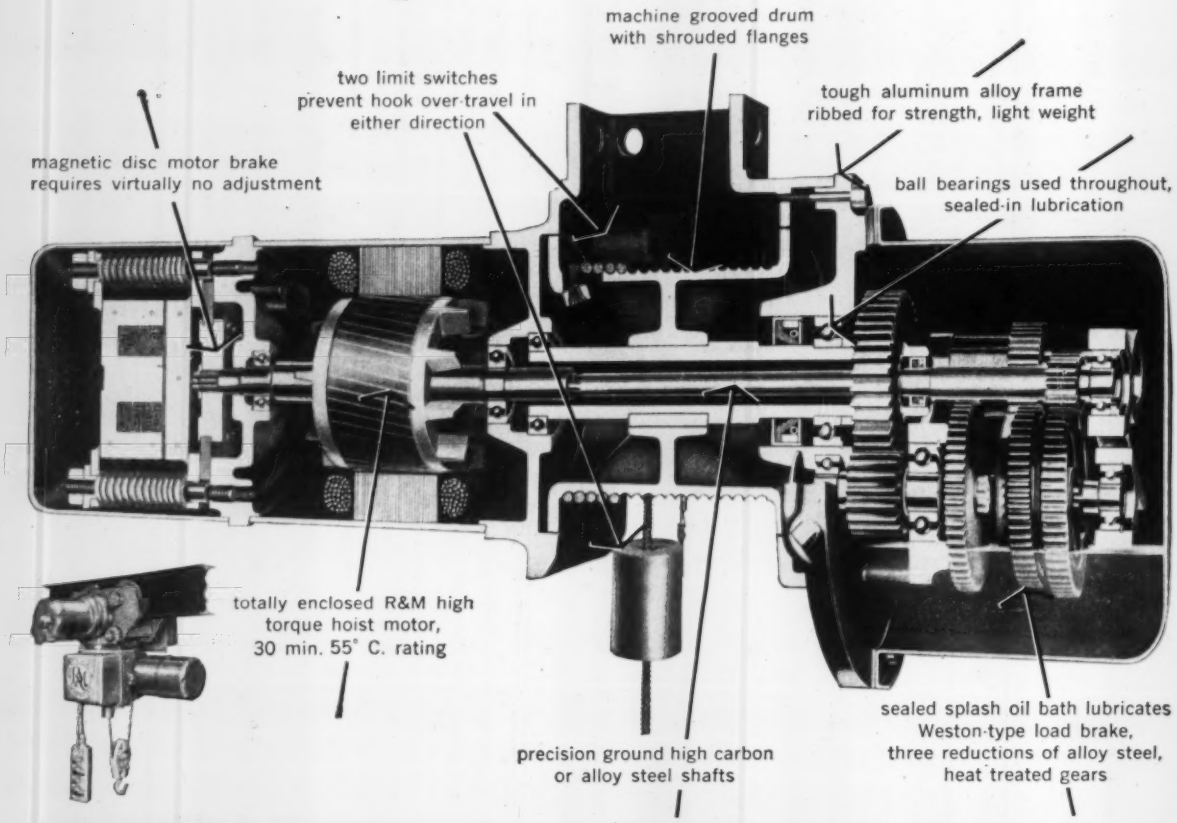
~ ~ ~

Table of Contents, Page 5

Classified Advertising, Page 167

RED CIRCLE
Rolls
ALLOY-CHILLED
Hyde Park
Rolling Mill Equipment
For more than 50 years Hyde Park Steel Mill equipment has been helping American industry lead the world — equipment such as—
• Bar Mills
• Merchant Mills
• Sheet and Strip Mills
• Pinion Stands
• Roller Tables
• Reduction Drives
• Stretcher Levellers
• Guillotine Shears
• Sheet Mill Shears
• Roll Lathes
• Special Machinery
• Machine Work
For finer finish, long life and greater tonnage, specify Red Circle Rolls.

Hyde Park
FOUNDRY and MACHINE CO.
HYDE PARK
Westmoreland County, Pa.
Rolls
Rolling Mill Equipment
Gray Iron Castings



all new! hoist you'd build

R&M Type J hoists, now redesigned, give you the same quality engineering features *throughout* the line that have made Robbins & Myers hoists tops in industrial value. In the low price field the new Type J hoist features a trouble-free disc type motor brake for driftless spotting, and a sturdy Weston-type load brake. Upper and lower jam-proof limit switches, three gear reductions, and liberal use of ball bearings insure reliability. Robbins & Myers hoist motor has the highest time rating found in any low cost hoist—30 min., 55° C. This is the way you'd build it; the price is right, too.

Capacities: ¼, ½, 1, and 2 tons. Lug mounting and push-button control are standard. Push, hand geared, and motor driven trolleys available.

Robbins & Myers, Inc., Hoist & Crane Division, Springfield, O.

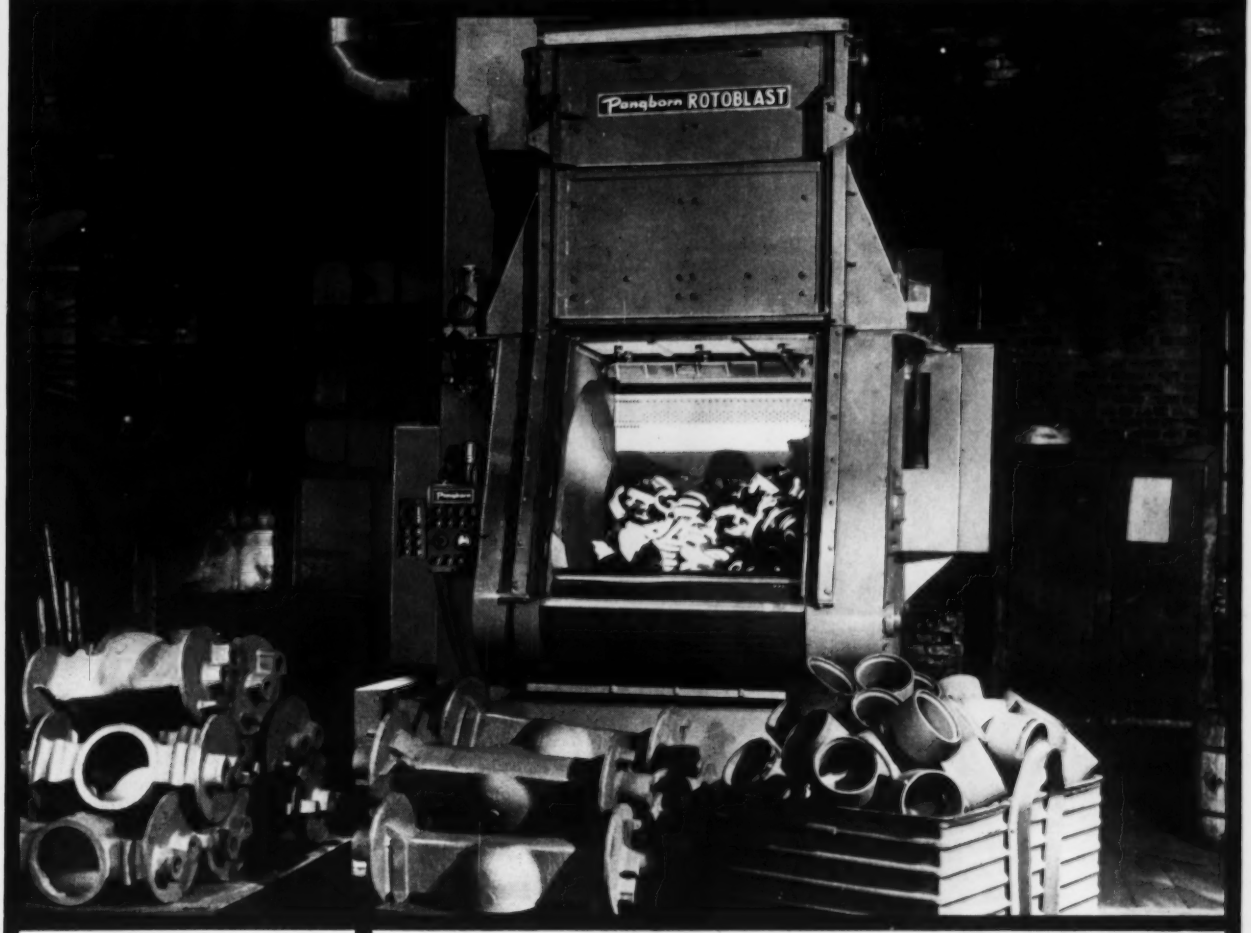
take it up with

ROBBINS & MYERS

hoists cranes

Request Bulletin 905 today

CUTS MAN-HOURS 38%



Pangborn Rotoblast cuts man-hours per day from 24 to 15 at Meadville Malleable Iron

The investment in a new 20 cu. ft. Pangborn Rotoblast Barrel has really paid off for Meadville Malleable Iron Co., Meadville, Pa.! By switching from a competitive barrel of about 12 cu. ft. capacity, the firm now cleans loads three times as large in half the time. Today tote box loads averaging 1900 lbs. each are cleaned in 4-5 minute cleaning cycles. As a result, the Rotoblast Barrel has cut 24 man-hours per day to 15 man-hours in the cleaning department and greatly improved the quality of the work.

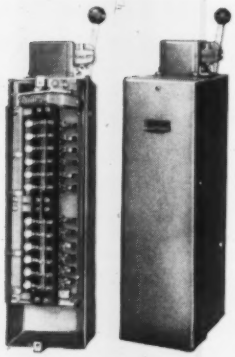
How much time and money can Pangborn Rotoblast save you? It would pay you to talk to the Pangborn man in your area. Or write PANGBORN CORP., 1600 Pangborn Blvd., Hagerstown, Md. *Manufacturers of Blast Cleaning and Dust Control Equipment and Rotoblast Steel Shot and Grit.*

Pangborn

CLEANS IT FAST WITH ROTOBLAST®

Use the "THIN" Master

The Cutler-Hammer 14951 Type D Master Switch is designed especially for crane cab and mill pulpit use where space is at a premium and dependable "pin-point" control is so necessary. Compact in design yet so easy to install and service. The Cutler-Hammer "Thin" Master employs the basic principles of design and construction that have been tested and proved over many years of service in the metal working and allied industries. Save space . . . save installation and wiring costs . . . save operator fatigue. Specify Cutler-Hammer Thin Masters for precise control, dependable control. For detailed information, write for Bulletin 14951-G213. Cutler-Hammer Inc., Milwaukee 1, Wis.



- **Compact in design . . . only 7⅜" wide**
- **Lever head can be rotated in 90° steps for greater operator efficiency**
- **Available with or without "Off" position latch**
- **Adjustable lever tension for improved operator "feel"**
- **Available in 6, 12, and 16 circuits with up to 6 speed points in each direction**
- **Choose the enclosed type for base or wall mounting, or the open type for benchboard installation**
- **Double break silver to silver vertical contacts individually removable**

CUTLER-HAMMER
CONTROL
C-H

CUTLER-HAMMER

Cutler-Hammer Inc., Milwaukee, Wis. • *Division:* **Airborne Instruments Laboratory.** • *Subsidiary:* **Cutler-Hammer International, C. A.**

Associates: Canadian Cutler-Hammer, Ltd.; Cutler-Hammer Mexicana, S. A.; Intercontinental Electronics Corporation.